AUGUST 18, 1997 VOLUME 14, NUMBER 33

Networ

THE NEWSWEEKLY OF ENTERP

Access denied

How to safeguard your intranet

INTRANet

A Network World Supplement

ALSO IN THIS ISSUE:

- *Chief knowledge officers and their Webs*
- *Review: OpenConnect's OC://WebConnect Pro*
- *Handbook: MIME*

Begins after page 43

NEWSPAPER $5.00

VIVID

LAYER 3 SWITCHED ROUTING TODAY.

Build faster, simpler to manage LANs based on MPOA standards.

Take a quick tour at:

www.vivid.newbridge.com/quicktour

NEWBRIDGE

Newbridge Networks Inc. 593 Herndon Parkway, Herndon, Virginia USA 22070-5241. Newbridge and logo are registered trademarks and VIVID, VIVID logo are trademarks of Newbridge Networks Corporation. ©1997. All rights reserved.

Circle Reader Service **#31**

AUGUST 18, 1997 VOLUME 14, NUMBER 33

NetworkWorld

THE NEWSWEEKLY OF ENTERPRISE NETWORK COMPUTING

Leaving no Stone unturned

Novell lures [illegible] Christopher Stone to join its management ranks. Our interview, page 12.

Java developers rise up

New lobbying group to put pressure on industry giants.

By Chris Nerney

Frustrated by what its founder calls the unfulfilled promise of Java, a disparate group of application developers last week formed a lobbying organization to pressure industry giants to improve Java tools and standards.

The Java Developer's Lobby (JDL) apparently has hit a nerve: Several hundred members from around the world signed on in the first few days of its existence.

It also has attracted the attention of Java creator Sun Microsystems, Inc., which contacted JDL founder Rick Ross last Wednesday to discuss the group's concerns and find common ground.

Ross, founder of Java developer Activated Intelligence in New York, said he began the JDL because "the voices of individual developers can't easily rise above the din created by the PR machines of the big companies."

The struggle between Sun and Microsoft Corp. — which are marketing competing Java platforms — often has left the needs of Java developers unfulfilled, he said. "There has not been enough

See JDL, *page 80*

Putting their heads together

Lotus CEO Jeff Papows and Microsoft's Bill Gates planned to meet in Redmond, Wash., last week to hash out differences over Java and distributed object technology. Page 80.

Start-up's switches could foster new 'Net services

By Tim Greene
Milpitas, Calif.

Art Klein realized right away that the last thing the world needed was another Gigabit Ethernet start-up.

When Klein and a group of engineers left Alantec Corp., after the company was acquired by FORE Systems, Inc. in 1995, the engineers' first thought was to join the high-speed Ethernet scramble. But Klein, formerly vice president of sales at Alantec, squashed that idea. The engineers came back a week later with Plan B: build a high-end switch designed to improve Internet access.

The result is Assured Access Technology, Inc., a company led by Klein that next month will introduce six- and 10-slot high-density access switches for Internet service providers and very large corporate user sites.

CEO Klein said Assured's Layer 3 switches will enable ISPs to offer four different service-quality levels to virtual private network (VPN) customers and — as the start-up's name implies — provide assured access to the Internet.

In addition, the company plans

See Assured, *page 82*

PROFILE: ASSURED ACCESS TECHNOLOGY, INC.

Based:	Milpitas, Calif.
Founded:	September 1996
Funding:	$19 million from Mayfield Fund, Sequoia Capital and others
Employees:	50
Products:	High-density remote access switches supporting analog, ISDN, frame relay and leased lines
Competitor:	Ascend
Fun fact:	The company successfully pitched its business plan to venture capitalists using just six presentation slides

Get more info online: 3422

- Details of a competing line from Ascend
- VPN primers and news

www.nwfusion.com

IBM to tackle IP, SNA integration

By Michael Cooney
Atlanta

IBM next week will unleash communications software designed to reduce the pain and cost of integrating large interconnected SNA and TCP/IP backbones.

The company will roll out tn3270E server and load-balancing software that makes it possible to off-load communications processing from mainframes and spread it among less expensive data center connectivity hardware. The tn3270E software gives PC users access to SNA resources via IP links.

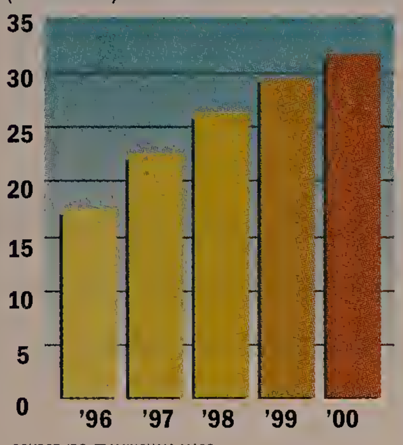
Executives outlining IBM's connectivity plans at last week's Share user group meeting confirmed the company will outfit its 3746 front-end processor, 2216

See SNA, *page 78*

TN3270 ON THE RISE

Worldwide tn3270 licenses are expected to increase.

(In millions)



SOURCE: IDC, FRAMINGHAM, MASS.

Lotus customers festering over buggy software

By Paul McNamara
Cambridge, Mass.

There are rumblings of discontent among Lotus Development Corp. customers and business partners over what some see as an infestation of bugs in the company's recent software releases.

More than a dozen interviews conducted by *Network World* over the past few weeks reveal a perception — by no means universal — that Lotus is shipping buggier software as of late. Most attributed that

See Bugs, *page 82*

Hire learning

These smart, young MIS graduates are on the right track.

By Charles Bruno

Marc Catalano and Jeremy Krall shared a common goal as top MIS majors at Babson College in Wellesley, Mass.: Both were determined to dot their resumes with a litany of internships that gave them practical experience with a variety of computer and network systems.

The strategy paid off handsomely, as both students found themselves in high demand this past spring. Each interviewed with 15 to 20 companies and ultimately sifted through five or six serious offers before coming to a final decision. Krall accepted a job as an internal Web developer for Quantum Corp., a PC storage maker in Milpitas, Calif. Catalano now works as a senior PC/LAN analyst at insurance giant John Hancock in Boston.

Network World spoke with the two classmates to gain an understanding of the techniques companies are using to woo top MIS/networking graduates and, more importantly, to understand what these graduates believe works and what needs reform.

See New Grads, *page 50*

Looking for fresh IS recruits?

You're not alone. See page 51 for hiring tips from this man and other IS managers.

Quantum's

JASON GROW

ANYTIME TWO COMPANIES LIKE

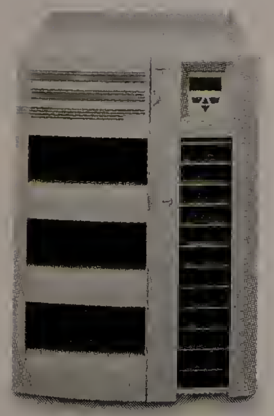
COMPAQ AND MICROSOFT

get together

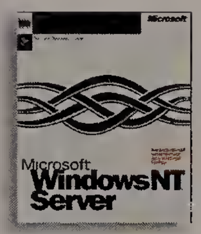
YOU CAN EXPECT A LONG LIST OF

IMPRESSIVE RESULTS.

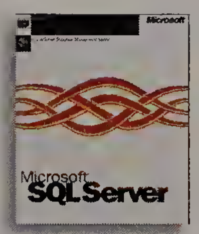
SAY WE START WITH $1,000 IN SAVINGS.



Compaq ProLiant 6000



Microsoft Windows NT® Server



Microsoft® SQL Server™

SMART-2DH Array Controller

*Buy a Compaq ProLiant 6000, Microsoft Windows NT® Server, SQL Server™ and a SMART-2DH Array Controller and get $1,000** off when purchased together. You can take advantage of another sweet deal on our ProLiant 2500* and ProLiant 5000*. But only until October 31st.*

Whether your needs are transaction processing, or query intensive, this platform provides the ideal foundation to build client/server applications for inter/intra/extranets. For more information see your reseller or visit us at www.compaq.com

COMPAQ Microsoft®

FRONTLINE PARTNERSHIP

*Buy a ProLiant 2500, Microsoft Windows NT Server, SQL Server, and a SMART-2P Array Controller, and get $500 off the total purchase when purchased together. Buy a ProLiant 5000, Microsoft Windows NT Server, and a SMART-2DH Array Controller and get $500 off the total purchase when purchased together. **All prices and price reductions shown refer to U.S. estimated reseller prices. Actual reseller prices may vary. Free offer with purchase of qualifying product from a participating reseller from 8/1/97 to specified end date, while supplies last. Offers not valid on Compaq refurbished products. All others are subject to product availability, and are valid only in the U.S. Compaq reserves the right to change, alter or cancel these programs at any time without notice. ©1997 Compaq Computer Corporation. All rights reserved. Compaq registered U.S. Patent and Trademark Office. ProLiant is a registered trademark of Compaq Computer Corporation. Microsoft, Windows NT, and Microsoft SQL Server are registered trademarks of Microsoft Corporation. All other brands and product names are trademarks or registered trademarks of their respective companies.

Unicenter TNG Is The Smartest Way To Manage Any Network.

"Unicenter TNG enables us to correlate a wide variety of information from desktops, servers and network devices."
— Steven Ruegnitz
VP Lehman Brothers

After years of struggling to manage distributed networks, network managers are replacing their hodgepodge of various tools and piecemeal solutions with a single, integrated network management solution.

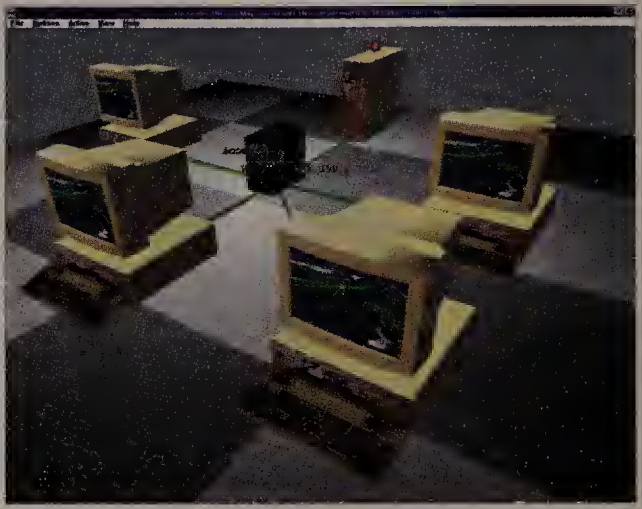
One that can manage the entire enterprise and all your networks, including TCP/IP, DECnet, IPX/SPX and SNA.

Only Unicenter TNG Offers End-to-End Management.

Unicenter® TNG™ offers automatic, intelligent, object-oriented network management that enables you to manage proactively. So you can anticipate and solve problems before they happen.

Unicenter TNG gives you a single point of control for your complex and heterogeneous global network. Its dynamic auto-discovery ensures that your network configuration is current. The Real World Interface™ allows for better visualization of your network. And third-party tools such as element managers integrate with Unicenter TNG through its open and extensible architecture.

Unicenter TNG Is The Industry Standard For Enterprise Management.



The Real World Interface uses virtual reality to create a 3-D environment that represents objects just as they appear in the real world.

Unicenter TNG is an integrated solution for end-to-end enterprise management. With support for every major hardware platform and operating system, Unicenter TNG is open, scalable, extensible and always vendor-neutral.

The Best Feature Of All: Unicenter TNG Is Shipping Today.

SHIPPING TODAY

Unicenter is a proven software solution that's available today. It's real, mission-critical and up and running in thousands of sites around the world for some of the smartest users in the world. Users who know that working smarter always beats working harder.

For More Information Call 1-888-864-2368 Or Visit www.cai.com

COMPUTER® ASSOCIATES
Software superior by design.

Unicenter® TNG™

©1997 Computer Associates International, Inc., Islandia, NY 11788-7000. All other product names referenced herein are trademarks of their respective companies.

Circle Reader Service #22

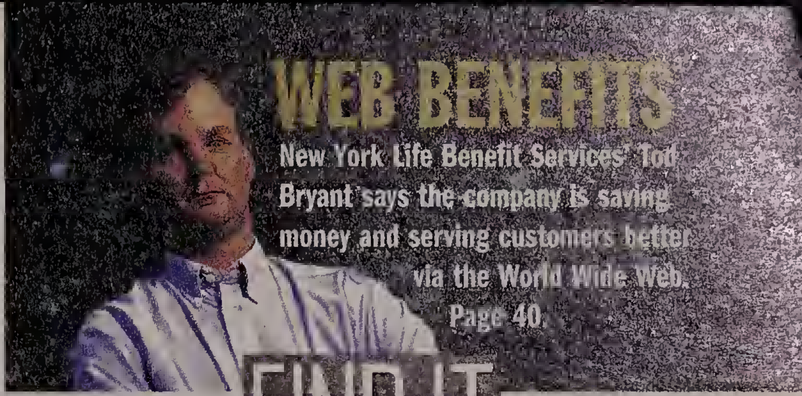
JAVA AT YOUR SERVICE

Electronic commerce is booming at one Canadian company's Web site. Page 35.

HOST WITH THE MOST

Bay's new channel-attached gateway links IP nets to mainframes. Page 78.

WEB BENEFITS



New York Life Benefit Services' Tod Bryant says the company is saving money and serving customers better via the World Wide Web. Page 40.

SHAWN G. HENRY

NetworkWorldContents

August 18, 1997 Volume 14, Number 33

News

6 **Transarc looks** to beat Microsoft on DFS for NT.

8 **Mobile options** are freeing thin clients from corporate desktops.

9 **Toshiba to enter** broadband market.

12 **Ascend remote-access** box jammed full of security features.

15 **pcAnywhere32 8.0** gains Windows NT hooks.

16 **OnLive Technologies** brings document and audio conferencing to your desktop.

Local Networks

17 **National Semiconductor's** purchase of Cyrix could mean thin clients will really sell for $500.

17 **Virtual Motion moves** to address need for Web-based NT Remote Access server management.

18 **Dave Kearns:** Following a different NT script.

Internetworks

23 **Bay bolsters** remote access line with new concentrator.

23 **IBM's 'Net division** pushes on.

27 **Kevin Tolly:** Defining the IP-SNA boundary.

Carriers & ISPs

33 **Concert preps** its frame relay network to support voice traffic.

33 **New FCC policy** could cut telecommuting costs.

34 **David Rohde:** Swords may turn into plowshares before foreign rates really drop.

Intranet Applications

35 **Customers give** Netscape a fighting chance in the groupware/messaging market.

36 **Mustang charges** into e-mail management market.

37 **IBM testing new** Java technology on video games first.

40 **Microsoft, competitors** maneuver for control of streaming media market.

44 **Scott Bradner:** False idol?

Technology Update

47 **Wireless LANs** get standardized.

Management Strategies

63 **Recognizing the early** warning signs of employee dissatisfaction can help prevent resignations and promote harmony.

Opinions

48 **Editorial:** Police the 'Net, don't regulate it.

48 **Wayne Spivak:** Doing the math to resolve the NT vs. Unix debate.

49 **James Kobielus:** Netscape is an enterprise groupware contender.

84 **Mark Gibbs:** An Apple for Bill means you will be assimilated.

84 **'Net Buzz:** Venture capital survey could show record quarter; $10 million for a song; realtors find home on Internet; the book on Web businesses.

Network Help Desk. Page 47.

Message Queue. Page 48.

Editorial and advertiser indexes. Page 76.

SPECIAL FOCUS

Directories

Network management complexities lead to increasing role of directories. Page 30.

FEATURES

HIRE LEARNING: *Two top MIS grads, fresh from the interview process, have ideas on how you can land bright, young talent.* **Page 1.**

Five new rules for playing the hiring game. **Page 51.**

REVIEW: *Consolidated servers, led by Cubix, hold sway over traditional servers in manageability and reliability.* **Page 59.**

JASON GROW

FIND IT ON FUSION

To quickly get to any online info referenced in *Network World*, enter its DocFinder number in the input box on the home page.

9999

NetworkWorld Fusion
www.nwfusion.com

This Week

Only on Fusion

Keeping Current. You'd think an RBOC would know how to install something simple, like a 56K bit/sec line, without any problems. You'd think wrong, writes Fred McClimans in a diary of two installations gone awry. **DocFinder: 3431**

Multimedia. Oracle last week published what it hopes will become a standard for converting live broadcasts into streaming video. **DocFinder: 3432**

WAN services. Regulators in Great Britain have begun investigating whether the owners of trans-Atlantic undersea cables have engaged in price fixing. **DocFinder: 3434**

ATM. MCI and Bell Canada last week announced cross-border ATM service. **DocFinder: 3433**

From the front page

Read our story about IBM's latest plans to link TCP/IP nets to mainframes, then come online for a package of articles and white papers on integrating TCP/IP and SNA. **DocFinder: 3419**

User Excellence Award

Nominate your company for our annual award with our online entry form. **DocFinder: 3318**

HOW TO GET ONTO NETWORK WORLD FUSION

At the welcome screen, click on First Visit and follow the instructions. Subscribers, keep your NWF number – highlighted on the front cover's mailing label – handy during registration. Nonsubscribers must fill out an online registration form.

How to contact us

WRITE: Network World, 161 Worcester Road, Framingham, MA 01701; **CALL:** (508) 875-6400; **FAX:** (508) 820-3467; **E-MAIL:** nwnews@nww.com; **CIRCULATION:** (508) 820-7444; nwcirc@nww.com; **STAFF:** See the masthead on page 16 for more contact information.

News briefs, August 18, 1997

Bell Atlantic/NYNEX get together

■ Bell Atlantic Corp. and NYNEX Corp. late Thursday passed their final merger hurdle — approval from the Federal Communications Commission. The FCC attached a long series of previously negotiated conditions to the merger. The conditions require the merged company to open its network to potential competitors at the FCC's mandated wholesale prices, even though a federal court recently overruled the FCC's authority to set those prices (*NW*, July 28, page 10). The merger is now expected to close shortly.

Sun to shine on the Web

■ Sun Microsystems, Inc. tomorrow will unveil its Ultra Enterprise 450 workgroup server, a platform for the development and deployment of Web-based, three-tier business applications written in Java. Sun also will announce a set of tools for use with the Enterprise 450, including Netscape Communication Corp.'s SuiteSpot server software and an enterprise application server from Kiva Software Corp. of Palo Alto, Calif. Product details and pricing were unavailable.

Oracle's Sedona meets its maker

■ Oracle Corp.'s object-oriented programming environment, code-named Sedona, is officially dead. Following an intensive investigation of the project, which was launched three years ago, Oracle decided to pull the plug, said Dennis Moore, Oracle's vice president of marketing for development tools. "The way Sedona was originally designed, using DCOM, Windows NT and BASIC, it will not produce what we intended, which is zero-administration thin clients, scalable applications servers," he said. Elements of Sedona will be incorporated into Oracle's other development tools, namely Developer 2000 and Designer 2000.

Entrusting message security

■ Entrust Technologies, Inc., a vendor of encryption and public-key infrastructure management products, today announced what it calls its e-mail strategy to layer Entrust security technology on top of existing messaging products.

Entrust said its Entrust PKI, Entrust/Express and Entrust-ready applications are now available for Microsoft Corp. Exchange and Outlook. By the third quarter, Entrust will be adding its security application layer to Lotus Devlopment Corp.'s Lotus Notes and cc:Mail, as well as Netscape Communication Corp.'s Messenger, Novell, Inc.'s GroupWise and Qualcomm, Inc.'s Eudora Pro.

Digital selling out of net biz?

■ Digital Equipment Corp. last week did not rule out that it could sell some or all of its Network Products Business unit. *The Wall Street Journal* reported last week that Digital is shopping the unit to Bain Capital of Boston and Lucent Technologies, Inc. for $500 million to $750 million. That price is about equal to the division's annual revenue, but about half of what the unit could have fetched two or three years ago.

In a statement, Digital said, "The current network portfolio includes areas that are integral to Digital's strategy as well as areas that are complementary to Digital's strategy. We are always exploring a variety of possible relationships with other companies to optimize our network solutions. We announce these relationships when they occur, if appropriate."

Controlling the floodgate

■ Check Point Software Technologies, Ltd. next month will release a new applicaiton package for its FireWall-1 Internet firewall package. Code-named Floodgate, the new software will work with FireWall-1 to let network managers dynamically allocate network bandwidth and more easily control the mix of traffic at network access points. Pricing and shipping dates were not available.

Transarc shoots to beat Microsoft Windows NT on distributed file front

By Christine Burns
San Francisco

IBM subsidiary Transarc Corp. is shooting to get a full-blown distributed NT file system out the door before Microsoft Corp. can roll out one of its own.

Transarc last week said that by November it will ship DFS Server for Windows NT 4.0. The software allows an administrator to create a virtual file system comprised of files that reside on multiple distributed NT servers.

The system makes it easier to manage dispersed NT files and gives end users transparent file access regardless of their location on the network.

Microsoft has a similar but scaled-down NT 4.0 add-on called Windows NT Dfs available now. But by Microsoft's own admission, it will not ship a complete Distributed File System (DFS) until NT Server 5.0 hits the streets sometime next year. Officials there said the Microsoft Dfs implementation will benefit greatly from integration with the NT 5.0 Active Directory Service.

Transarc officials argued that DFS Server for Windows NT 4.0, which is grounded in standard Distributed Computing Environment (DCE) DFS technology, will be more useful than Microsoft's offering in heterogenous environments because it can interoperate with DFS products that support the DCE standard.

This would enable a network administrator to create a single, logical view of files stored on NT, IBM's Unix-based AIX and OS/390 mainframe systems, Sun Microsystems, Inc.'s Solaris and Hewlett-Packard Co.'s HP-UX systems.

Mitch Kramer, an analyst with Patricia Seybold Group, Inc., said the early release of Transarc's product and its cross-platform support could give the company a leg up.

"When it comes to cross-platform support, Microsoft is always the loser," Kramer said.

NT product manager Jeff Price said Microsoft's product allows an administrator to establish a logical view of files stored on Novell, Inc. NetWare and IntranetWare and Unix servers. But for users to access those files from the Dfs directory tree, additional server gateway or client software is necessary.

Kramer pointed out, though, that Transarc will be charging $1,800 per server for its product, whereas Microsoft plans to ship its Dfs as part of the operating system. Users may hold out for the built-in capability.

Transarc's DFS product marketing manager Gail Koerner said Transarc's feature-rich product warrants the price.

Bundled with the DFS Server for Windows NT 4.0 will be a graphical user interface called Control Center, which will let an administrator manage DFS servers on multiple platforms from one NT workstation.

It also will offer automated replication and advanced security services. Replication between DFS servers ensures that duplicate copies of the same files — which may be distributed to remote sites for high-availability and performance reasons — remain consistent across the network.

For security, the Transarc product employs the industry-standard Kerberos 5 specification for client/server authentication.

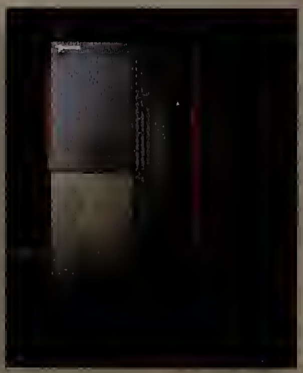
✆ Transarc: (412) 338-4400

Head-to-head comparison

	Transarc	Microsoft
Product	DFS Server for Windows NT 4.0	Windows NT DFS
Base technology	Distributed Computing Environment's DFS	Microsoft's CIFS
Operating system platform	NT Server 4.0	NT Server 4.0 with Service Pack 3
Management interface	Transarc Control Center for managing DFS links across platforms	DFS Administrator for managing NT-only DFS links
Availability	Third quarter of 1997	Available now with limited functionality; full release set for 1998 when NT 5.0 rolls out
Price	$1,800 per server	Beta free via the Web; to be bundled with NT 5.0

QUICK TAKE: CS150 WINDOWS NT SERVER

Tandem rolls out two two-way servers in one package



Tandem Computers, Inc. last week introduced the CS150, which consists of two dual-processor Windows NT servers packaged in the same cabinet.

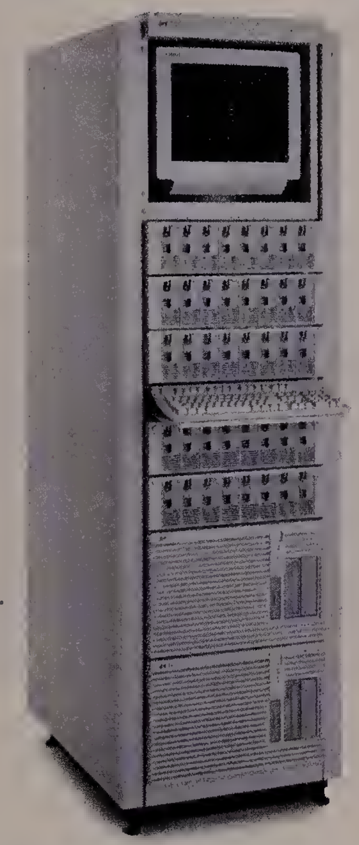
The 200-MHz Pentium Pro machines are united in a cluster via Microsoft Corp.'s Cluster Server (formerly Wolfpack) failover technology and Tandem's ServerNet high-speed server interconnect.

The servers can be configured to run as two one-way servers, two two-way symmetric multiprocessor servers or one active two-way server with a passive two-way server in reserve, said Adriana Vela, a Tandem product marketing manager. Each server within the cluster can support up to 1G byte of memory, and together the nodes can handle up to 310G bytes of data storage.

The entry-level NT machines are designed for customer sites where reliability is essential, such as bank branch offices and retail stores. The machines are primed to run applications such as datamarts and e-mail, and Tandem is offering Dynamic Link Libraries to make Lotus Development Corp.'s Notes and other applications cluster-aware.

Pricing for the CS150 starts at $15,000.

Tandem: (800) 482-6336



NEW PRODUCT

The New HP NetServer LXr Pro and Rack Solution

Intel Pentium Pro 200 MHz processor with 512KB cache and up to four-way multiprocessing
Also available in 1MB cache versions
HP NetRAID PCI Disk Array Controller with three Ultra SCSI channels, connects up to eight drives per channel
Up to 10 I/O slots: six bus master PCI, four EISA (one EISA slot reserved for system)
LAN Support and Comprehensive Network Support available as HP SupportPack
128MB/512MB ECC memory expandable to 4GB
Three hot-swap Redundant Power Supply standard

Fastest four-way.* Over 1TB of storage.

Let's get ready to Rack.

www.hpresource.com/racks

*Based on benchmark numbers of 9,198 TPM. The Intel Inside logo and Pentium are registered trademarks of Intel Corporation. ©1997 Hewlett-Packard Company

HEWLETT®
PACKARD

Mobile options arrive for thin clients

By John Cox

Thin clients are not just for desktops anymore.

New software available this week, as well as a new specification due out next month, will let mobile users carry around a portable thin client as they work. By freeing the thin-client computer from the desktop, vendors hope to trigger a flood of new applications and make it an alternative to Windows-based laptops in some applications.

Cruise Technologies, Inc. this week will release Version 2.2 of its CruiseConnect firmware — a client/server package that can connect a handheld terminal via a radio link to an NT applications server.

The new version supports TCP/IP, so the end user can employ TCP/IP networks to access Windows applications on distant servers. Previously, the wireless client could connect only using the IPX protocol via a local LAN server.

The second advance for mobile thin clients comes next month. Companies backing the Java-oriented network computer (NC) will release API specifications and sample Java code that will let users deploy mobile NCs. IBM and Sun Microsystems, Inc. both hinted they will have mobile NC products by year-end.

These two releases represent the two different approaches to mobile thin-client computing. A server-oriented thin client typically is a terminal-type device that accesses Windows applications on a remote server. Optional software can let users access Unix or mainframe applications.

By contrast, Java NCs are client-oriented: They are true computers, with a compact operating system of some kind and plenty of local RAM. They pull Java applications and data from a server but run the applications and store the data locally. The mobile NC specification, spearheaded by Apple Computer, Inc., IBM, Oracle Corp., Netscape Communications Corp., Sun and 10 other companies, is aimed at this style of computing.

AN INTERNET LINK FOR WIRELESS WINDOWS

Product: CruiseConnect 2.2
Vendor: Cruise Technologies, Inc., Arlington Heights, Ill.
What it does: Lets a Windows terminal, such as the Wyse Winterm, link via radio to a Windows application server.
What's new: Now runs over TCP/IP.

The new CruiseConnect release supports TCP/IP to access Windows NT servers anywhere. The server must be running a multiuser version of NT, such as WinFrame from Citrix Systems, Inc. On the server side, CruiseConnect also supports Dynamic Host Configuration Protocol, which automatically assigns an IP address to remote clients.

This is important for mobile systems because the physical device can move to different networks and needs to be given a new address when it does, said Chris Gladwin, CEO of Cruise Technologies, based in Arlington Heights, Ill.

The software can eliminate the need for a local server entirely, said Mark Wille, network engineer with HealthPoint, a Cary, N.C., software vendor. HealthPoint beta-tested CruiseConnect 2.2. "The wireless device can connect to the radio access point, to an Ethernet segment, then to a router to go out over the network," Wille said. "This significantly reduces the costs for companies that have lots of remote sites with small numbers of users."

Eliminating the costs of local servers means higher value for customers deploying wireless thin-client systems, said Jeffrey Schlesinger, senior wireless technology analyst at UBS Securities LLC, a New York brokerage house. "You can change and manage all your software centrally and support that application in thin clients running anywhere."

The wireless LAN market is about $200 to $300 million a year, Schlesinger said, but it is growing from traditional strongholds, such as warehousing, into new markets, such as health care.

The proposed specification for mobile network computers initially will offer APIs to solve three problems facing users that need local computing power and have only occasional network access.

One API will let NCs automatically synchronize changes to data between the NC clients and central servers; one will let the mobile NC adjust to and manage different types of remote communications; the third API will support different power management options for batteries or standard AC wall plugs. ■

THE WORLD'S SHORTEST SHORT STORIES. *Two of a series.*

ONCE UPON A TIME, THERE WAS AN I.S.
MANAGER WITH A NETWORK PROBLEM.
THEN HIS VENDORS KEPT POINTING
FINGERS AT EACH OTHER UNTIL
FINALLY HE WENT INSANE.

The End.

The Moral:
Call WilTel if you never want to deal with vendor finger-pointing again.

SIEMENS

Buying a phone should be a calculated decision.

The reasons to own the Optiset E family of phones just keep adding up. Send in this card for more information and you'll receive a free Optiset calculator. This sleek little piece of electronic wizardry looks just like an Optiset E phone. And it's just as easy to use.

Name, Title

Company

Street Address

City, State, Zip

1-800-765-6123 ext. A17.

www.siemenscom.com/optiset

SIEMENS

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST-CLASS MAIL PERMIT NO. 715 SAN FERNANDO, CA

POSTAGE WILL BE PAID BY ADDRESSEE

DEPT. 235
SIEMENS BUSINESS COMMUNICATIONS
PO BOX 9000
SAN FERNANDO, CA 91341-9957

IP Switching

Toshiba spinoff to go after broadband 'Net access

Ennovate Networks seeks to crack North American IP switching mart; company to face-off vs. Cisco and Ipsilon.

By Jim Duffy

Tyngsboro, Mass.

In an effort to crack the nascent American market for broadband Internet access, Toshiba Corp. is forming a company to develop high-speed routing switches for customer premises and service provider points of presence.

Called Ennovate Networks, Inc., the company will leverage Toshiba's Cell Switch Router (CSR) technology as the foundation for the new products. CSR accelerates IP routing by switching long-lived IP flows.

Ennovate will develop a broadband access router that will concentrate IP flows over frame relay and ATM WAN links and shuttle them to a Toshiba CSR 5300 core router in the carrier backbone.

The WAN links will support T-1/E-1, T-3/E-3, 155M bit/sec OC-3 and 622M bit/sec OC-12 rates.

Ennovate did not disclose details on the product's configuration.

In addition to switching IP flows, the Ennovate edge router also will switch IP traffic based on preconfigured topology, company officials said.

Topology-based IP switching will enhance scalability, according to Ennovate officials, because it avoids flow-by-flow setup procedures that can create bottlenecks in public Internet networks, where the number of flows is very high.

Toshiba's CSR 5300, which is currently undergoing beta testing, supports flow- and topology-based IP switching. The CSR 5300 was announced earlier this year (*NW*, Feb. 10, page 15) and will ship in two to three months, Ennovate officials said.

PROFILE: ENNOVATE NETWORKS, INC.

Based:	Westford/Chelmsford, Mass.
Mission:	To enable service providers to deliver IP applications and services
Funding:	$3 million from Toshiba and Mitsui
Product:	Broadband access router based on Toshiba's Cell Switch Router technology
Competitors:	Cisco, Xedia and Ipsilon

Ennovate's broadband edge router will not be a CSR 5300 with WAN interfaces, Ennovate officials emphasized.

It will be built "from scratch" with "completely new" hardware, said Ian Mashiter, Ennovate vice president of sales and marketing.

The broadband access router will compete with Cisco Systems, Inc.'s 3800 Multiservice Access Unit, Ipsilon Networks, Inc.'s IP Switch ATM 1600 and Xedia Corp.'s Access Point. Ennovate plans to ship the product before year-end.

Analysts said Ennovate has an opportunity to build a presence in the broadband access market.

Unlike Ipsilon, Ennovate is embracing ATM signaling standards and working with Cisco on the IETF Multiprotocol Label Switching (MPLS) standard. MPLS ostensibly will enable the Ennovate product to interoperate with Cisco's 7500 and 12000 routers and BPX ATM switches.

"If they start selling an IP switching solution and it's standard-based, and it works with Cisco — who has a significant market share — I think they have a shot at it at least," said Deborah Mielkie, senior broadband consultant at TeleChoice, Inc., a consultancy based in Verona, N.J.

Ennovate has $3 million in seed money from Toshiba and Mitsui & Co., Ltd.

The company is using that to attract engineers and software developers from the New England area, said Elliot Gerberg, vice president of engineering for Ennovate.

Gerberg came from Digital Equipment Corp., where he most recently was a director in product development engineering in the company's Network Product Business unit.

© Ennovate: (617) 273-9000

It's the same old story. Everyone blaming everyone else for your network problem. Meanwhile, nothing gets fixed. Well, with WilTel it's simple: When you have a problem, we have a problem. In fact, we'll take responsibility for every aspect of your enterprise network, including design, installation, maintenance and monitoring. And if you need anything at all, we'll come running. End of story.

WilTel℠
A Williams Communications Group Company

YOUR NETWORK. OUR RESPONSIBILITY.℠

For the rest of the story, call WilTel at 1.888.9WilTel   www.wiltel.net

Solutions^3

3Com 10/100/1000 switching:

Keeping *you on the* Fast Track.

With our switches, you can upgrade to Gigabit Ethernet and ATM whenever you're ready.

3Com SuperStack® 10/100/1000 switching protects your investment, keeping you comfortably on track as demands on the network grow.

The new SuperStack II Switch 3000 10/100 gives you the choice of 10 or 100 Mbps on every port, providing the flexibility to migrate your workgroup network to higher performance when you need it. And you can easily upgrade your backbone to 1000 Mbps Gigabit Ethernet or ATM.

SUPER STACK®

SuperStack II switches provide unequaled reliability and fault-tolerance to support all your mission critical applications. And TranscendWare™ Remote Monitoring (RMON) software on every port keeps you in control.

You've come to rely on 3Com as the world's leading supplier of workgroup switching with the service and support to back it all up. Maybe it's because of all the industry recognized awards our SuperStack II switches have received. Maybe it's our installed base of over 3 million user ports.† Whatever the reason, you can plan on a fast, smooth journey into the future.

Don't get left behind — Call us to receive our switching guide "Fast Track to the Future."

1-888-906-3COM (ext. 100)
www.3com.com/switch3000

*New SuperStack II Switch 3000 10/100. Provides auto-sensing 10/100 on every port - plus Gigabit Ethernet or ATM migration when you need it. Available now for only $3,495.**

3Com®

©1997 3Com Corporation. 3Com and SuperStack are registered trademarks and TranscendWare is a trademark of 3Com Corporation. †Source: Dell'Oro Vendor LANscape 5/97: 3Com 10 and 100 Mbps workgroup switches 28% market share (ports). *U.S. List Price.

Novell casts object proponent Stone in key strategy role

Christopher Stone, new vice president of strategy and corporate development, says Novell needs to extend its products to support objects.

Eric Schmidt had no illusions about trying to turn around Novell, Inc. by himself when he came aboard as CEO in April. He wasted little time cleaning house among the executive ranks and now is handpicking his management team.

Novell recently named former IBM executive John Slitz as vice president of marketing. The company last week tapped Object Management Group (OMG) founder and CEO Christopher Stone as vice president of strategy and corporate development. Stone spoke with *Network World* Senior Editor Christine Burns last week about Novell's future and where object technology fits into the company's plans.

How dire is Novell's situation?

It's not dire. The whole industry move toward distributed objects as an infrastructure is forcing a lot of companies that have made money on real fast protocols to take a look at their strategy. Novell obviously fits that model. Since the bar has been raised, what do we do about it? The advantages Novell has are a huge installed base, really talented people and good products. It needs strategy, direction and partnerships to move it off the dime.

Novell's *Christopher Stone*

How big a role will the OMG's Common Object Request Broker Architecture (CORBA) and object technology in general play in Novell's future?

It will be huge. The nice thing about this new position is that I don't have to change my view of the world. My view always has been distributed computing and network services using objects.

Look at the two guys Novell's got now: Me, the biggest proponent of distributed objects, and look what Eric did with Java. These are the two biggest open computing platforms in the past eight years, and both of us are now together in one company. That's a pretty powerful statement.

With Novell's history of delivering proprietary technology, how well suited are its products to accommodate standard object technology?

I have some work to do. This is the classic capitalism issue where you work on new products but you don't pillage the customer base. So it's a strategy of migration in some form and interoperation with new products in other cases. That is what object technology does best. It helps you integrate legacy systems with the newer systems that you are trying to build.

If you have a NetWare/IntranetWare network now, what does incorporating object technology actually mean?

Simply, Novell's past and current business has been in providing a platform for networks and adding services that specifically enhance that platform — such as file, print and NDS [Novell Directory Services] — not as separate distributed services. Novell must create demand for a series of services based on object technology, specifically Java and CORBA, that continue to support and interoperate with the current platform. But the company also has to provide a more open, rich development environment for new applications.

www.nwfusion.com

FIND IT ON FUSION 3 4 2 1

Get more online:

- **An expanded version of this Q&A**
- **Similar interviews with Denice Gibson, head of Novell's Internet Products Division, and Robert Hicks, president of the Novell-Netscape joint venture Novonyx**

What will it let customers do that they can't do now?

Well, you want the same set of services available for a variety of operating environments including NT, Solaris, embedded and real-time systems. We're all tired of writing applications 10 times for 10 platforms.

Microsoft Corp. is making its Distributed Common Object Model work transparently with its operating systems. Does Novell have similar plans with CORBA?

Yes. You will see Novell make IntranetWare a distributed object platform. Novell has been working with Visigenic Software, Inc. on object broker technology. But you will see other things as well. We are talking about distributed services, not just having it buried inside an operating system. This isn't just file and print anymore. It's things like security services, transactions and services like audio/video streaming. Anything out there can be a distributed object service.

Will network services translate into better financial numbers for Novell?

That's one of the ways to do it. Will that make Novell a $3 billion company next year? No. It will have an impact, but it will take some time.

This is a turn-around situation. We have got to work with the installed base. We have a migration/integration issue. We have got to add more tools.

It's crossing that line of maintaining a revenue stream of existing products while building new products and getting new revenue from those. Managing that line is really hard. ■

Ascend packs remote access box with security

By Tim Greene
Alameda, Calif.

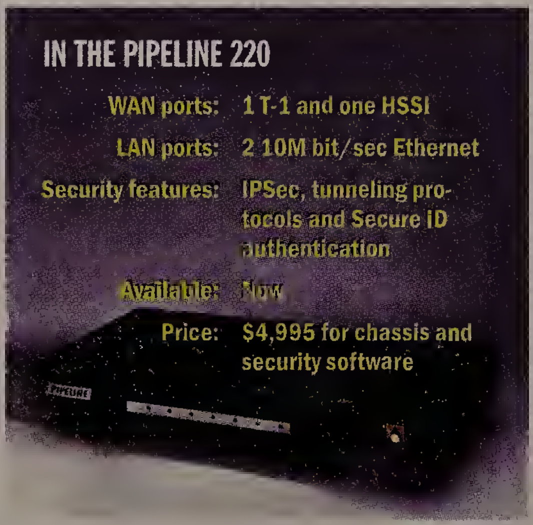
Ascend Communications, Inc. last week announced the Pipeline 220, a remote access router that runs Ascend's new SecureConnect software and supports firewall, encryption and authentication functions.

The router has two WAN ports -- a 1.54M bit/sec DSU/CSU and a high-speed serial interface — and two 10M bit/sec Ethernet ports.

In addition to SecureConnect, the dual Ethernet ports give an added measure of security to early Pipeline 220 user Team America Corp., of Columbus, Ohio. The company is an employee benefits outsourcing firm that uses the Internet to support remote access.

According to Bill Haase, who is in charge of strategic development for Team America, he can use one Ethernet port to route traffic into a public Web server, which is essentially a contained area, and the other to support access to the Team America LAN.

End users connecting to the Team America site hit the Pipeline 220. The SecureConnect software then demands a four-digit personal identification number and a randomly generated numeric password from a Security Dynamics Technologies, Inc. Secure ID token. The password is authenticated by a Security Dynamics ACE server inside the SecureConnect firewall, Haase said.


IN THE PIPELINE 220

WAN ports: 1 T-1 and one HSSI
LAN ports: 2 10M bit/sec Ethernet
Security features: IPSec, tunneling protocols and Secure ID authentication
Available: Now
Price: $4,995 for chassis and security software

The Pipeline 220 checks with a Team America Windows NT directory for the user's profile and opens parts of the firewall accordingly.

Depending on the user profile, SecureConnect can offer less stringent screening for access to less sensitive data, Haase said.

"What's important to understand is we have options to meet different clients' needs and what holds that information is the directory," he said.

Once a user is cleared for access, Team America uses IP tunneling that is part of SecureConnect to secure traffic between the remote user and the Pipeline 220. In addition to tunneling, the device supports Secure Sockets Layer encryption.

The Pipeline 220 supports PPP, the frame relay wide-area protocol, the PPP tunneling protocol, Layer forwarding protocol and Ascend's own tunnel management protocol.

Ascend last week also announced Secure Access Personal Edition — software for Windows 95 and NT workstations that supports a firewall and encryption for mobile users or remote sites that consist of one client.

The Pipeline 220 chassis costs $2,995, plus $2,000 for the Secure Access firewall and encryption. Secure Access Personal Edition is sold in license packs of 25 at $99 per user.

©Ascend: (510) 769-6001

Be a **NET KNOW-IT-ALL**

For the **answer** to this week's question and more net trivia, **visit Network World Fusion** and enter **2349** in the DocFinder box.

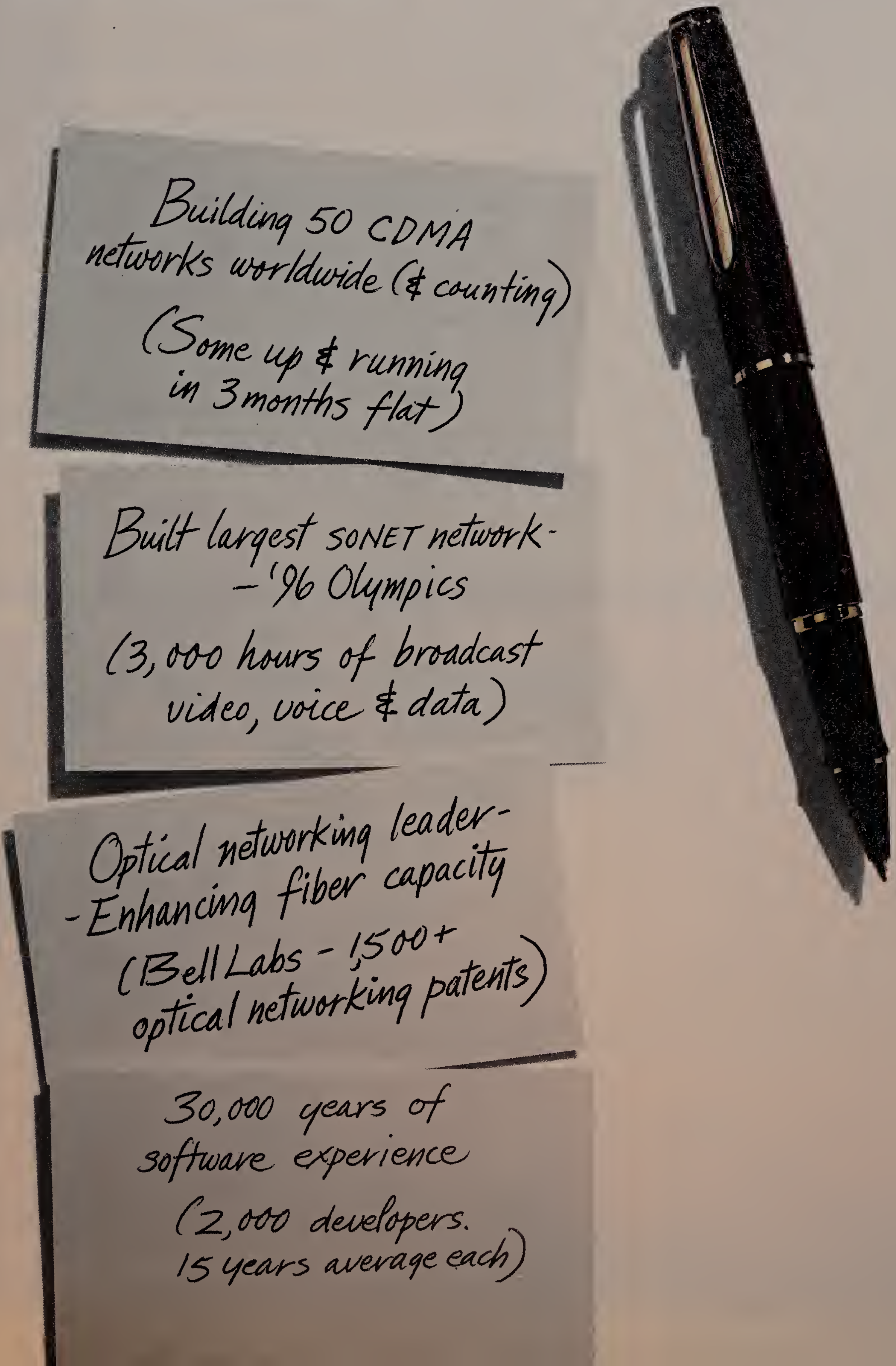
GET THE ANSWER *Now*

This week's question:

CATNIP, TUBA, SIP and PIP were among the proposals leading to the development of which Internet standard?

"Everyone tells me they know their way around **networks.**

What makes you any different?"



Building 50 CDMA networks worldwide (& counting)
(Some up & running in 3 months flat)

Built largest SONET network - '96 Olympics
(3,000 hours of broadcast video, voice & data)

Optical networking leader - Enhancing fiber capacity
(Bell Labs - 1,500+ optical networking patents)

30,000 years of software experience
(2,000 developers. 15 years average each)

©1997 Lucent Technologies

We know networks.
Every twist.
Every turn.™

Symantec gives remote control software NT boost, debuts Java tools

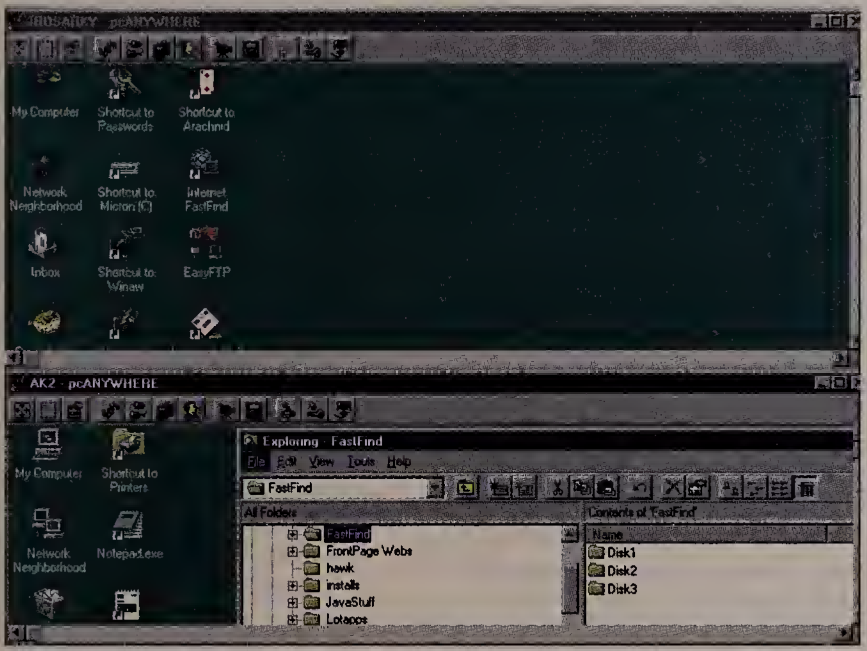
Version 8.0 of pcAnywhere remote control software gets rolled out.

By Tim Greene

Cupertino, Calif.

Symantec Corp. last week introduced a Windows NT-friendly update to its pcAnywhere32 software, a program that gives end users remote control of their PCs.

With pcAnywhere32 8.0, companies can use Windows NT authentication software to define end-user access to networked PCs. Traffic also can be encrypted using Microsoft Corp.'s Crypto API.



Symantec's pcAnywhere32 8.0 *supports two simultaneous remote control sessions.*

In addition, pcAnywhere32 logs can be recorded in a Windows NT event log for review by net administrators. Using a new utility, administrators also can stop, start and check the status of Windows NT PCs being accessed via dial-up lines.

Version 8.0 also lets remote users print files accessed on an NT PC. In addition to Windows NT clients, the new Symantec software supports Windows 95, 3.1 and DOS clients. Aside from the new NT-related features, Version 8.0 supports switching between a remote control session and a voice call for remote users dialing in with standard data/fax modems. The software also can handle simultaneous voice and data sessions. Another feature allows end users to lock a PC when the remote connection is broken, preventing anyone physically near the desktop computer from accessing it.

Multiple remote end users can log on to a single PC using pcAnywhere32 8.0, enabling remote training sessions and other applications.

Version 8.0 is available now and costs $149 for two licenses. Current customers can upgrade for $79.

© Symantec: (800) 441-7234

New versions of Visual Cafe for Java boast Navigator links.

By Ellen Messmer

Cupertino, Calif.

Symantec Corp. last week announced it is readying three new Java development tools aimed at letting everyone from Webmasters to programming gurus write Java applications based on Version 1.1 of the Java Development Kit (JDK 1.1).

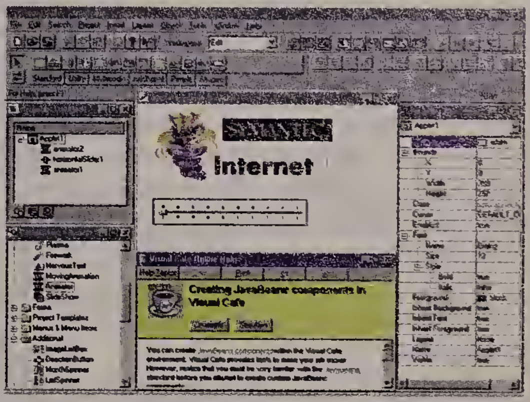
By mid-September, Symantec plans to ship three editions of Visual Cafe for Java, each designed to ease programming by functioning as rapid-application development (RAD) tools that generate and recompile code on the user's behalf.

The Java tools will be integrated tightly into the next version of Netscape Communications Corp.'s Communicator so users can test-run the Java applications they develop in the Netscape groupware browser.

The first product, Symantec's $99 Web Development Edition of Visual Cafe, is intended for use by Web developers writing Common Gateway Interface scripts. "They can build forms and animation in Java," said Sheri Schurter, marketing manager for Symantec.

The second product, the $299 Professional Development Edition, will include Symantec's VisualPage authoring tool and more debugging and compiling power than the Web Development Edition. The third product, the database development tool, will come with Netscape's FastTrack Server and its own set of wizards for generating access to databases with the Java Database Connectivity code.

Though Sun Microsystems, Inc.'s Java Foundation Classes (JFC) are still a work in progress and not, strictly speaking, a part of JDK 1.1, Symantec hopes to include the JFCs in the three new tools.



Symantec's Visual Cafe *for Java will let you develop JDK 1.1-compliant Java applications and applets.*

Symantec has been the clear market leader in Java RAD tools, according to Framingham, Mass.-based consultancy International Data Corp (IDC). IDC Research Director Evan Quinn predicted that by year-end, about 200,000 Java RAD tool licenses will be sold, "and the majority of [them] will be Visual Cafe."

Some users said they are eager to try Visual Cafe for Java. "If it works the way they claim, it will have a kind of interactive debugging," said Antone Ritter, intranet development engineer at Computer Sciences Corp. That means when programmers find errors, the Java tool will do the debugging and recompilation in the background while the programmers continue with their work. ■

Definitely not a one-trick pony

$195

Introducing The XCD Pony™ Print Server

- **Compact Design** - fits almost any printer, including the HP LaserJet® 6P
- **Multiprotocol Support** - NetWare®, TCP/IP, Windows® 95, Windows® NT, Appletalk®
- **Internet Remote Printing** with XCD Printranet™
- **Extensive Management Capabilities** including HP JetAdmin™ support
- **Configuration Flexibility Solutions** for virtually any printing applications

Bred from a long line of top performers in the print server market, the multiprotocol XCD Pony™ Print Server is heads and tails above the competition with the lowest price for the fastest speed, best performance, and the smallest form factor on the market today.

pony
XCD PRINT SERVER

XCD Incorporated
3002 Dow Avenue #110
Tustin 92780
(714) 573-7055
(714) 573-7084 fax

The Pony™ and Printranet™ are trademarks of XCD Incorporated. All trademarks are hereby acknowledged.

yes
it runs with NetWare

Buy Before 9/30/97 and Qualify For Your "Ponies for Cash Rebate"

EVERY PRINTER
EVERY NETWORK

(800) XCD-9538

http://www.xcd.com
sales@xcd.com

XCD

Circle Reader Service #29

Netscape pushes out Netcaster push tool for Web users

By Sari Kalin
Mountain View, Calif.

Netscape Communications Corp. last week released Netcaster, the push component that was missing from the company's recently released Communicator groupware/e-mail client.

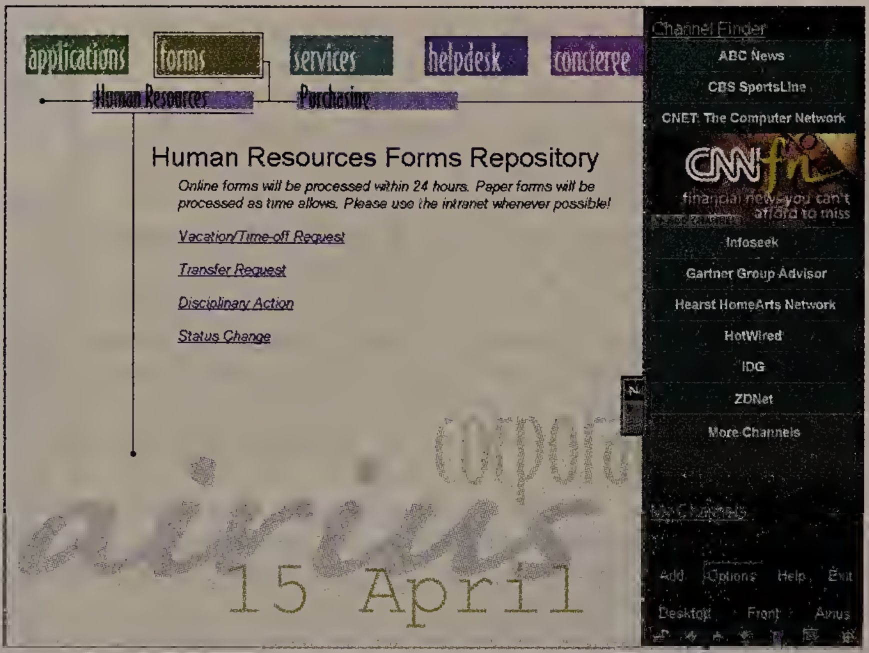
Using Netcaster, Web surfers can subscribe to channels — Web sites they want to have send information to their desktops on a regular basis — and look at those and other Web sites offline.

Netcaster also can be used to build a "Webtop" that enables end users to watch for pushed information even if they are using other applications.

Netscape, which has been wooing content providers to support Netcaster while Microsoft Corp. drums up support for its rival Channel Definition Format, last week boasted of having more than 700 Netcaster channels, including business-oriented premier channels for *Fast Company* and Federal Express Corp.

At sites that are labeled Netcaster Ready, Web surfers can click on an "Add Channel" button to plug in channel-provider-specified default settings to Netcaster. At other Web sites, Web surfers can spell out what information they want pushed to them and how frequently they want it.

Netscape is pitching Netcaster to corporate customers to use the Webtop feature on their intranets.



Human Resources Forms Repository

Online forms will be processed within 24 hours. Paper forms will be processed as time allows. Please use the intranet whenever possible!

Vacation/Time-off Request

Transfer Request

Disciplinary Action

Status Change

Netscape's Netcaster *has more than 700 channels from which to choose.*

Netcaster became available last week with Communicator 4.02 and Communicator Pro, which are priced at $59 and $79, respectively.

On the defensive

Separately, Netscape found itself on the defensive last week following the release of an industry report that says the company is losing its ability to define Internet standards and influence large corporate customers.

The report, entitled "Netscape's Diminishing Role as an Internet Superstar," was released by Aberdeen Group, Inc., a Boston-based consultancy.

The report, written by Tim Sloan, Aberdeen's director of research for Internet infrastructure, states that Netscape is losing market share, is no longer able to define Internet standards and will find itself competing with its partners Sun Microsystems, Inc. and IBM for large accounts. Netscape officials angrily rejected the report's conclusions.

"Tim based his analysis on false assumptions, and as a result his conclusions are false," said Danny Shader, Netscape vice president of industry and developer relations.

In the white paper, Sloan said the majority of Netscape products installed in large companies actually were sold by vendor partners that include IBM, Hewlett-Packard Co., Sun and Digital Equipment Corp.

"When Netscape announced that the SuiteSpot server will include e-mail and directory servers, major vendors started to reconsider if they want to bring Netscape into their Fortune 1,000 accounts because Suite-Spot will directly compete with their own mail, directory and security products," Sloan said.

He added that Netscape has little presence among Fortune 1,000 companies and that its distribution partners will push their own products to corporate accounts rather than SuiteSpot.

Wrong, said Netscape.

"We recently won 200 new companies making up 2 million seats for client/server systems," Shader said. "Fact is that the corporate sales came from our direct sales force."

Kalin is a correspondent with IDG News Service's Boston bureau.

NetworkWorld
Editor in Chief: *John Gallant*
Editor: *John Dix*

NEWS
News Editor: *Doug Barney*
News Director: *Bob Brown*
Associate News Editor: *Michael Cooney*
Phone: (508) 875-6400
Enterprise Editor: *Charles Bruno*
Phone: (407) 381-7801; Fax: (407) 381-7903

NETWORK WORLD FUSION
Online Editor: *Adam Gaffin, Phone: (508) 820-7433*
Online Senior Writer: *Todd Wallack,*
Phone: (508) 820-7532; Fusion Designer: *John Fischer*

LOCAL NETWORKS
Senior Editor: *Christine Burns,*
Phone: (508) 820-7456
Senior Editor: *Jodi Cohen, Phone: (508) 820-7449*

INTERNETWORKS
Senior Editor: *Jim Duffy, Phone: (508) 820-7525*
Senior Writer: *Tim Greene, Phone: (508) 820-7422*
Staff Writer: *Marc Songini, Phone: (508) 820-7484*

CARRIERS & ISPS
Senior Editor: *David Rohde*
Phone: (202) 879-6758; Fax: (202) 347-2365
Senior Writer: *Denise Pappalardo*
Phone: (202) 879-6745; Fax: (202) 347-2365

INTRANET APPLICATIONS
Senior Editor: *John Cox, Phone: (508) 834-0554,*
Fax: (508) 834-0558; Senior Editor: *Ellen Messmer,*
Phone: (202) 879-6752, Fax: (202) 347-2365;
Senior Writer: *Paul McNamara, Phone: (508)*
820-7471; Senior Writer: *Chris Nerney,*
Phone: (508) 820-7451

COPY DESK/LAYOUT
Managing Editor: *Michele Caterina*
Senior Copy Editor: *Sandra Gittlen*
Copy Editors: *Melissa Adams, Lisa Kaplan Adase*

ART
Design Director: *Rob Stave*
Associate Art Director: *Tom Norton*
Senior Designer: *Allyson Nickowitz*
Graphic Designers: *John Fischer, Paul M. Lee*
Graphics Coordinator: *Pauline Chouinard*

FEATURES
Features Editor: *Paul Desmond,*
Phone: (508) 820-7419, Fax: (508) 820-1103
Managing Editor, Features: *Amy Schurr,*
Phone: (508) 820-7485, Fax: (508) 820-1103
Associate Features Editor: *Susan Collins,*
Phone: (508) 820-7413, Fax: (508) 820-1103
Senior Editor, Features: *Kathy Scott,*
Phone: (508) 820-7489, Fax: (508) 820-1103

REVIEWS
Test Center Director: *Lee Schlesinger*
Phone: (508) 820-7416
Senior Editor, Tests and Reviews: *Jim Brown*
Phone: (508) 820-7408; Fax: (508) 820-1103

Test Alliance Partners: *Stephen Cobb, Cobb Associates; Todd Coopee, Trinity College; James Gaskin, Gaskin Computer Services; Steven Goldberg +G Systems; Bob Larribeau, Larribeau Associates; Howard and Kristin Marks, Networks Are Our Lives; Edwin Mier, Mier Communications, Inc.; National Computer Security Association; Joel Snyder, Opus One*

Contributing Editors: *Daniel Briere, Mark Gibbs, James Kobielus, Edwin Mier, Mark Miller, Alan Pearce*

Buyers Guide Contributors: *Tony Croes, Linda Musthaler, Currid & Co.; Mark Miller, DigiNet Corp.; James Kobielus, LCC, Inc.; Edwin Mier, Mier Communications, Inc.; Daniel Briere, Melodie Reagan, Christine Heckart, Liza Henderson, Beth Gage, TeleChoice, Inc.*

Teletoons: *Phil Frank, Joe Troise*

INTRANET
Executive Editor: *Beth Schultz, Phone: (773) 283-0213, Fax: (773) 283-0214*
Senior Editor: *Peggy Watt, Phone: (415) 903-9519, Fax: (415) 968-3459*
Art Director: *Tom Norton*

Assistant to the Editor: *Cheryl Crivello*
Office Manager, Editorial: *Glenna Fasold*
Editorial Assistant: *Pat Josefek*

OnLive aids audio communications, conferencing over IP nets

By Denise Pappalardo
Sunnyvale, Calif.

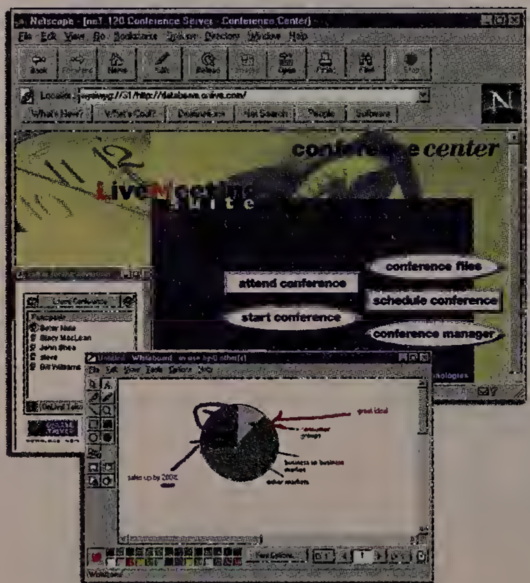
OnLive Technologies is expected to announce a new software suite next week that will let users share documents and hold audioconferences over IP networks.

The Windows NT-based LiveMeeting Suite server software combines OnLive's Audio Conferencing Server for voice and its LiveMeeting software for data conferencing. The server software can support 15 to 100 users simultaneously.

While the audioconferencing software is currently based on proprietary voice-over-IP specifications, OnLive is expected to offer an H.323-compliant version by year-end, said John Shea, senior director of product management.

H.323 is the International Telecommunication Union's (ITU) voice-over-IP specification. Users will not be charged for standards-based LiveMeeting Suite software upgrades, Shea said.

The LiveMeeting document conferencing software is based on T.120, the ITU multimedia teleconference specification, which interoperates with a variety of clients such as Microsoft Corp.'s NetMeeting, Intel Corp.'s ProShare and DataBeam Corp.'s Farsite client software.



LiveMeeting Suite *lets groups of users simultaneously talk and share documents over their corporate intranet or the Internet.*

Users access LiveMeeting Suite using a standard browser interface and their company's appropriate URL (see graphic). Network administrators can set up LiveMeeting for corporate users to access the conference center over a private intranet or the public Internet.

The LiveMeeting server, which typically is stored at a central location, also stores an archive of conferences. When users set up their conferences, they have the option of using ID and password authentication for added security. This is an especially useful tool for sensitive material that users may want to archive.

Instill Corp. is deploying LiveMeeting to improve interaction between its remote workers and boost productivity.

Initially, the company will deploy OnLive's server software at its headquarters in Palo Alto, Calif., to improve communications between its sales representatives, said John Gilmore, chief operating officer at the company.

Instill provides electronic transaction and information services to the food service industry.

The second phase of deployment will include providing Instill's customers access to the LiveMeeting server. The server is expected to be up and running by the end of the month.

The LiveMeeting Suite server software is available for $5,800 to $25,000 for 15 to 100 users, respectively.

© OnLive: (408) 617-7000

Local Networks

Covering: LAN Hubs, Switches, and Management • Operating Systems • Servers • Thin Clients

Briefs

■ **Samsung Electronics Co., Ltd.** *last week completed the $150 million purchase of PC server vendor* **AST Research, Inc.** *of Irvine, Calif. The deal was sealed after Samsung purchased more than 28 million AST shares at a rate of $5.40 per share, making AST a wholly owned subsidiary of the Seoul, South Korea-based electronics firm.*

■ **Intel Corp.** *last week announced a PC-based Ethernet/ Fast Ethernet adapter that can be used by network managers to remotely turn on desktop PCs for virus scanning, software upgrades and general maintenance. The* **EtherExpress Pro/100 adapter,** *which will be bundled with PCs from IBM and others, includes In-tel's LANDesk Service Agent and IBM's Wake on LAN technology.*

© Intel: (800) 538-3373

■ *Houston-based start-up* **NuView, Inc.** *last week struck its first big OEM deal for delivery of ManageX, its object-oriented software for* **managing and monitoring Windows NT** *systems software and applications.* **Data General Corp.** *announced it will ship ManageX as part of the NTerprise Manager software package it bundles with with every Aviion server.*

The companies have integrated DG's existing server hardware monitoring tool, NTAlert, with ManageX so an administrator can manage all NT hardware, software and applications from the ManageX console. In the fourth quarter, all Aviion NT servers will include NTerprise Manager for a single server. Additional servers will start at $199.

© DG: (800) 328-2436

Merger could chip away at thin-client prices

By Marc Songini

Richardson, Texas

The $500 thin client may finally become a reality, and National Semiconductor Corp.'s planned $550 million acquisition of fellow chip maker Cyrix Corp. could be the driver.

While Oracle Corp. Chairman Larry Ellison and others have promoted the idea of a $500 network appliance, the devices typically have been priced at $1,000 and up.

According to National, its acquisition of Cyrix will help drive down PC prices. Together the companies will be able to offer entry-level PC, NetPC and network appliance manufacturers an inexpensive system-on-a-chip around which they can build their products.

"Our goal in life is to enable a huge growth in the sub-$1,000 category of network PCs and network computers," said Mike Bereziuk, general manager of the personal systems group at National.

The system-on-a-chip will combine National's 10M/100M bit/sec Ethernet, I/O, power management and other circuit technology with Cyrix's core CPU technology, which is based on the company's Pentium- and Pentium II-class technology. Putting all of this technology on one chip should help drive down manufacturing costs. Until now, Cyrix has not had the fabrication facilities of a company like National with which to pump out its 6x86MX processors.

Processor industry experts such as Linley Gwennap, editor of the industry newsletter "Microprocessor Report," said National is making a smart move in that the processor is virtually the only place to wring out the cost of making PCs. "National has a good idea — to take everything you need, put it on one chip and reduce the size and cost," Gwennap said.

However, Gwennap warned that it remains to be seen how much demand there will be for these low-cost PCs and net appliances.

National and Cyrix figure they may have a better chance at beating rival Intel Corp. in the low-end computer market than at the higher end where Intel dominates. However, Intel is not one to sit idly by and also has made efforts in the low-end market. The company recently announced its own acquisition of a system-on-a-chip company, Chips & Technologies, Inc.

CHIP VENDORS GET CHUMMY

Buyer	Company acquired	Acquisition price	What buyer gets
Intel	Chips & Technologies	$420 million	Expanded graphics and video capabilities
National Semiconductor	Cyrix	$536 million in stock	Low-cost processor technology

King of the hill

The PC will remain the king of the network, according to Intel. The "core of the market is driven by the PC. Every trend we're seeing reflects that," said Ron Peck, director of networked client marketing at Intel.

Still, lower priced chips will expand the definition of what a PC is, said Cheryl Currid, president of the consultancy Currid and Co. "[Lower priced chips] will put computers where computers aren't," Currid said.

However, the success of thin clients is not absolute, she said. "There is a belief that network computers and network PCs are cheaper to manage," Currid said. "We don't have all those numbers in yet."

Just in case the thin-client market fails to boom, National and Cyrix are eyeing other chip markets, including chips for remote access servers, hubs, switches and routers. ■

Get more info online:

- Predictions from industry players about the chip market over the next couple of years
- The latest news on CPUs
- An in-depth look at nanotechnology, which could one day replace today's computers

---

Virtual Motion makes Web-based management of NT RAS a reality

By Christine Burns

San Francisco

Virtual Motion, Inc. last week rolled out software that will let companies manage distributed Windows NT-based remote access servers via a Web browser.

The firm's WebConnect software is a new Web front end to its existing Remote Access Manager product. Remote Access Manager, which began shipping in October, is software that gives an administrator tools to monitor and control access to NT 4.0's built-in remote access server capabilities, called NT Remote Access (RAS).

Control and flexibility

WebConnect provides all the NT RAS management capabilities that Virtual Motion's existing Windows-based console offers. But because WebConnect can be used from any computer running a Web browser, the new software gives companies the flexibility to manage all NT RAS servers from anywhere on the World Wide Web.

The WebConnect software resides on a Web server based on Microsoft Corp.'s Internet Information Server Web server and can be used with any Web browser that supports Java applets.

Some of the tasks an administrator can do with this software combination include:

- Disable RAS logons
- Grant users RAS access privileges by port or server
- Enforce maximum RAS idle and connect time limits
- Limit RAS access by total connect time

"Anything that lets me go into a customer site and control those NT RAS boxes and how end users connect to them would be helpful," said Skip Taylor, manager of remote access services at CompuServe, Inc., which is evaluating several remote access management products.

WebConnect is available now. It will be bundled at no additional charge with the standard Remote Access Manager product, which costs between $395 and $1,595 per server based on port configuration.

© Virtual Motion: (415) 778-0100

PROFILE: VIRTUAL MOTION, INC.

Based:	San Francisco
Founded:	1995
Management:	Ken Hilliard, CEO and president, formerly of Xircom
Primary products:	Internet LanBridge, software that provides Internet access for LAN users over dial-up connections; Remote Access Manager, tools for managing NT RAS connections
Financials:	Undisclosed, company is privately held
Fun fact:	The company is supplying free Internet access software to South African schools.

WIRED WINDOWS

Following a different NT script

If you are a Unix administrator looking for an NT version of the shell scripts you're so used to with Unix, read on. Querisoft's DirectScript offering is a collection of Component Object Model (COM) objects that adhere to Microsoft's Active Directory Services Interface (ADSI) and can be used to administer large NT networks. If you are at all familiar with Visual Basic, you'll recognize COM objects as VB controls.

DirectScript works just as well with VBScript or JScript, bringing active management of your NT network to your Web browser.

Even though DirectScript is written to ADSI, the basis of Microsoft's Active Directory due in the NT 4 Enterprise edition this fall and NT 5 next year, DirectScript works just as effectively with the current NT 4 and even NT 3.51. The scripting product also is not limited to just directory services, allowing management of network and systems management services, too.

Included in the package are sample scripts in VB, VBScript and JScript to get you up and running quickly. The samples could be considered templates — plugging in names and identifiers for your net takes but a moment, and the scripts are ready to run. Among the dozens of samples are scripts to add, modify, delete and move objects such as User, Global Group and Printer.

Dave Kearns

Because DirectScript supports ADSI, the scripting package cannot be used to subvert NT security, which means you can build and distribute applications and applets without worry.

For example, if your User Account Policy specifies a minimum password length of six characters and you use DirectScript's User.SetPassword function to try setting a four-character password, the attempt will fail.

With DirectScript, you can build the utilities you want quickly and easily to manage an NT network of any size. You can add functionality not present in standard NT utilities or group together functions you use most into one application or related group of applets.

One example would be a school setting in which you might need to reinitialize desktops at the start of a class or training session.

DirectScript's extensible name space gives administrators with a good working knowledge of their current systems directory the ability to create utilities that will automate moving objects to NT's Domain or Active Directory system.

DirectScript sells for $695 per server, but 30-day evaluation copies are available for download from the Querisoft Web site (www.querisoft.com).

Tip of the week

In my column about L0phtCrack a couple weeks ago, I mentioned that backward compatibility with LAN Manager was a weak point in NT security. L0pht now tells me that Microsoft has released a patch for NT 4 to eliminate this compatibility. The patch is available at ftp://ftp.microsoft.com/bussys/winnt/winnt-public/fixes/usa/NT40/hotfixes-postSP3/lm-fix/. Be sure to read the README file before running it.

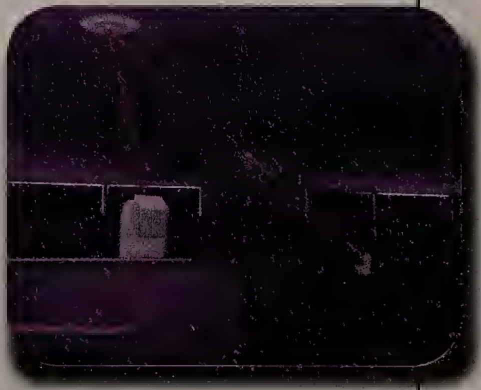
Kearns, a former network administrator, is a freelance writer and consultant in Austin, Texas. He can be reached at wired@vquill.com.

The JVC Wireless Infrared LAN

Secure, Flexible, Fast and Affordable

JVC Wireless Laptop LAN kit includes either a left or right PCMCIA card, a *Mobile unit* which is connected to the network backbone and a *T-Adapter* that provides standard DC power to the Mobile unit. JVC Wireless Laptop LAN provides a 10 Mbps wireless ethernet laptop link; an ideal quick LAN access connection for outside sales staff, visiting remote office personnel or telecommuting professionals.

JVC Wireless LAN kit includes two *Station units*, one connected directly to the existing LAN backbone and the second directly to a PC's network card or a standard hub to support an unlimited number of users. JVC Wireless LAN Kit is the perfect extension for existing wired networks to support frequently changing floor plans, older buildings, building expansions, temporary staffing requirements, manufacturing facilities or warehouses.



JVC Wireless Office LAN kit includes a 360° bi-directional ceiling mounted *Satellite unit*, connected directly to your LAN backbone, and two *Node units* connected to a PC's network card or hub. JVC Wireless Office LAN supports up to 30 workstations in a variety of facility network layout requirements ranging from small office workgroups to large open bay areas.

JVC's Infrared LAN incorporates the SECURITY of direct IR beam technology, true ethernet compatibility, throughput of 10Mbps and the FLEXIBILITY of choosing from three basic kits.

With no special software, gateways or protocol setup required, your installations will be FAST and AFFORDABLE.

Call JVC Today!

See JVC's website for rebate offering. www.jvcinfo.com

JVC PROFESSIONAL

JVC PROFESSIONAL COMPUTER PRODUCTS DIVISION

5665 Corporate Avenue
Cypress, CA 90630
Phone 714.816.6500
Fax 714.816.6519
Web Site: http://www.jvcinfo.com
Sales Information: info@jvcinfo.com

"We chose JVC's wireless infrared technology as an affordable alternative to our traditional wired LAN network because of our changing LAN and office requirements. We needed a flexible and reusable LAN solution while maintaining the throughput of traditional wired LAN's."

Dick Thorpe, Director of MIS at Siemens Hearing Instruments, Inc.

Authorized JVC Distributors:

CPU DISTRIBUTING
(800) 880-4200
www.cpu-distrib.com

ATI
(800) 544-7674
sales@alttech.com

TECH DATA
(800) 237-8931
www.techdata.com

Circle Reader Service #24

Frame Relay...

As Easy As Riding A Bike!

Frame Relay Products Save You Money on Network Costs!

If you're thinking about Frame Relay – Think Racal. Racal's new FastFrame™ digital access products give you the confidence you need to migrate your existing network to frame relay.

With FastFrame™ digital access products, frame relay networks are reliable, flexible and SNMP manageable! With Racal, Frame Relay is as easy as riding a bike.

- **Easy to configure** with Racal's Wizard configuration software!
- **Easy to Install** – Plug and Play
- **Easy to monitor your network's performance** with performance monitoring applications. Racal makes it easy for you to do data collection and data analysis for cost effective frame relay utilization!

To place your order, or for additional information on Racal products, call **1-800-RACAL-55 Ext. 800** today! Ask for your free Frame Relay network brochure or visit us at **http://www.racal.com/rdg/**

Racal FastFrame™ Products

When you think Frame Relay

Think Racal.

Racal Data Group

Access to Multimedia Information Networks

RACAL

Racal, Racal-Datacom and FastFrame are trademarks of Racal Electronics Plc. ©1997 Racal-Datacom, Inc. 5/97 VAA-1523

Circle Reader Service **#15**

TM

Your browser defines what your intranet can do. We assume you want your intranet to do everything.

The whole idea of Microsoft® Internet Explorer 3 is to make your intranet simpler. So let's keep this simple: Platforms. Build it on what you have. Run it on what you use. All the flavors of Windows®. Macintosh. In our next version: UNIX. Content. See it all. Write it all. ActiveX™, Java™, VBScript, HTML, even humble Microsoft Office documents. Administration and security. With the Internet Explorer Administration Kit, you have the only tool that lets you remotely manage and secure the intranet from your desktop. Please don't get up. Proof. Download Internet Explorer 3 at www.microsoft.com/ie/ (it's free). Then join corporations such as Shell, Arthur Andersen and Dayton Hudson who have already made their commitment to Internet Explorer 3. Future. Yours for the taking.

Where do you want to go today?®

www.microsoft.com/ie/

Microsoft

©1997 Microsoft Corporation. All rights reserved. Microsoft, Windows and Where do you want to go today? are registered trademarks and ActiveX and the Microsoft Internet Explorer logo are trademarks of Microsoft Corporation. Java is a trademark of Sun Microsystems, Inc. Other product and company names used herein may be trademarks of their respective owners.

Believe it.

EcoSCOPE

The truth about your networked applications.

Imagine. A network where everything is visible. Where you can see an applications view of network performance. Where you can identify application response time during specific time intervals. Where you can determine which application transactions are using critical bandwidth. And discover, measure and track application traffic enterprise-wide. The truth is now here. EcoSCOPE 3.0, the truth about your networked applications. To experience EcoSCOPE, visit our web site. Once you see it, you will believe.

www.compuware.com/ecoscope

1-800-368-4326

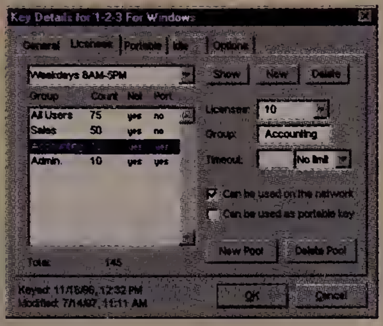
COMPUWARE

Circle Reader Service #12

Covering: TCP/IP • SNA • Network Management •
Muxes, Routers and WAN switches • Remote Access

Briefs

Sassafras Software, Inc. *is now shipping a new version of its KeyServer* **software license management** *package.*



Version 5.0 of KeyServer allows installation of the central license server on a Windows NT or 95 or a Macintosh/Power Macintosh computer. KeyServer 5.0 also features new autodiscovery, scheduling, authentication, passive metering and logging tools.

KeyServer 5.0 is being shipped free to customer sites that hold a KeyServer maintenance contract current as of May 1, 1997 or later.

☎ Sassafras: (603) 643-3351

Cabletron Systems, Inc. *last week announced the CSX-5500, a six-slot* **remote-access router** *that supports four wide-area interface modules for ISDN, frame relay, switched 56K bit/sec and X.25 technologies. The CSX also supports new CSXDIG-24 56K bit/sec modem cards. The cards support 24 digital and analog remote users. The CSX5500 ranges in price from $171 to $699 per port, depending on configuration. The CSXDIG-24 card costs $11,495.*

☎ Cabletron: (603) 332-9400

NetScout Systems, Inc. *last week announced the* **Application Response Time (ART) MIB,** *a proprietary extension of the Remote Monitoring 2 standard for gauging the impact of application conversations on network performance. The ART MIB provides application request/response pair timing information so users can gauge network delay based on elapsed time averages. NetScout will ship an Application Flow Monitor console in the fourth quarter.*

☎ NetScout: (508) 244-4000

Bay rounds out remote access line

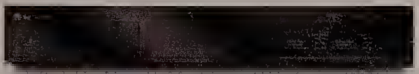
Customers can stack devices to support more than 100 connections.

By Jim Duffy
Billerica, Mass.

Bay Networks, Inc. last week unveiled a remote access concentrator for corporate sites and midsize Internet service providers as well as a RADIUS-compliant security server.

The Bay 8000 Remote Access Concentrator fills the gap in Bay's remote access line between the low-end Model 2000/4000 servers and the high-end, 600-port 5000 MSX chassis-based system.

The 8000 ties remote users to corporate LANs. It features dual ISDN Primary Rate Interface/T-1/E-1 WAN interfaces and Digital Signal Processor modems capable of 56K bit/sec data rates. It also features a single Ethernet attachment.



The Bay 8000 *Remote Access Concentrator can support 56K bit/sec modems from U.S. Robotics and Rockwell.*

The 8000 supports 46 to 60 ISDN B channels and 48 to 62 modems for T-1/E-1 trunks. It routes IP, IPX and AppleTalk traffic and is stackable. It can support 150 to nearly 200 remote connections in a three-high stack. The 8000 also supports 56K bit/sec modem technology from U.S. Robotics and Rockwell International Corp.

User approval

Southern Methodist University (SMU) in Dallas plans to install about six of the 8000s over the next year.

"For adding satellite remote access points, it's perfect," said Rich Andrews, senior Unix administrator at SMU. "The only downside to it is, due to the low amount of administrative overhead, you have a tendency to forget how you set up [the 8000] in the first place."

Analysts said Bay has to win over some big ISP accounts to be a top-tier player in remote access. The 8000 will go up against Ascend Communications, Inc.'s MAX 4048, which is well entrenched in ISP points of presence, and Cisco Systems, Inc.'s AS5200, which is rapidly closing in on Ascend's MAX.

"Since the beginning of the year, they haven't really announced any major sales wins. [With the 8000], they should be able to at least be a competitor in this space now," said Craig Johnson, director and principal analyst at Current Analysis, Inc. of Ashburn, Va.

The 8000 is priced at $19,995 and will be available in October.

Get more online:
- A Bay 8000 data sheet
- RADIUS white papers
- A buyer's guide to remote access gear

3414

Network World Fusion
www.nwfusion.com

Secure feeling

When users dial in to the corporate net, the 8000 will be able to route calls to Bay's new BaySecure Access Control security server. The server provides authentication, authorization and accounting of remote users for enterprise and service provider networks.

The security server supports the Remote Authentication Dial-In User Service standard for remote authentication.

It costs $4,500 for one device or $8,500 for a server and backup server. The product will be available on Windows and Windows NT in September and on Unix in November.

Separately, Bay is now shipping new Ethernet hubs and switches. The BayStack 303 Ethernet Desktop Switch, priced at $94 per port, sports 24 10M bit/sec ports and a single 100M bit/sec uplink. The BayStack 304 Ethernet Segment Switch features 12 10M bit/sec ports and a single 100M bit/sec uplink. It costs $125 per port.

The BayStack 150 Series 10Base-T hubs, comprising four models, start at $43 per port.

☎ Bay: (508) 670-8888

IBM's Internet Division crafts company vision

Little-known group has gargantuan task of dictating where IBM attacks the Web.

By Marc Songini

ANALYSIS

Some companies are born with the Internet, some achieve the Internet and others have the Internet thrust upon them. The revitalized IBM probably belongs in the last category — but it is going at the challenge with a vengeance.

Eighteen months ago, Big Blue created its Internet Division to gently push the massive company in directions Internet. A relative latecomer to the World Wide Web, IBM hopes the division will steer the company down a path that will make the 'Net useful for business and favorable to IBM and its products.

Ironically, a number of IBM analysts have never heard of the Internet Division. But apparently, that is the division's prevailing style: offer quiet direction to the rest of the company and help develop products that are eventually spun off to other divisions. "We were put in place to articulate IBM's overall stragegy for the Internet and network computing," said Irving Wladawsky-Berger, general manager of the Internet Division. "We're an umbrella organization that leads and coordinates the effort. This is a big deal, and it covers all parts of IBM. Each unit in IBM needs to evolve specific responsibilities to take advantage of the Internet."

Wladawsky-Berger has a staff of about 350 and a budget — he will not say how big — earmarked for research and development. One major efforts was developing a long-term Java strategy. The responsibilities for Java development have since been passed on to IBM's software division.

IBM's Internet *Division manager Wladawsky-Berger*

The Internet Division is working on a variety of products and services from Web servers and security tools to software. New electronic commerce initiatives are coming next month, including service and software systems packages, with Version 3.0 of the IBM Net.Commerce server as the centerpiece.

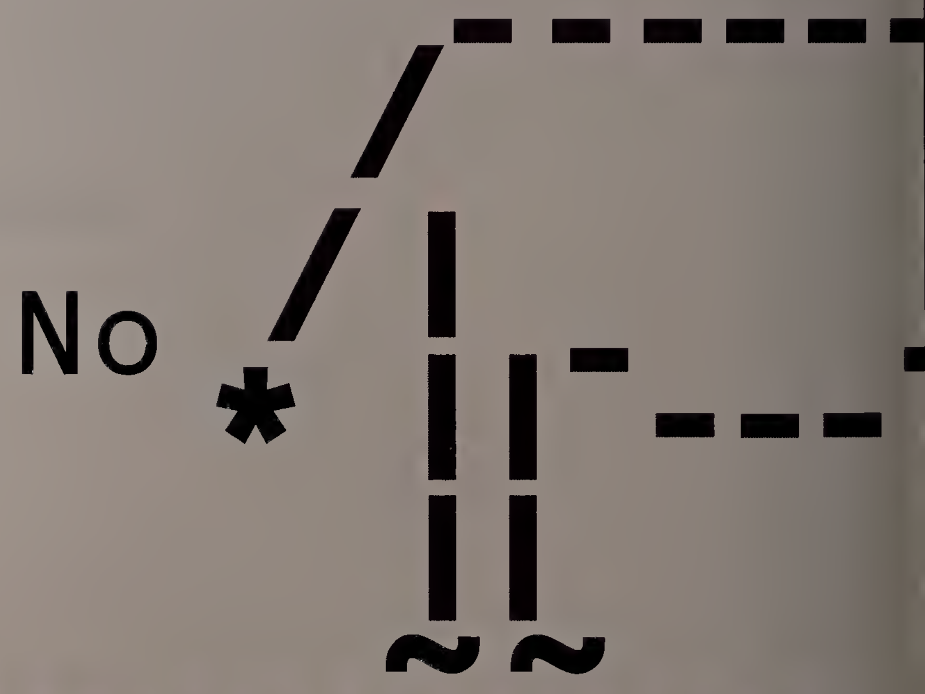
Although a recent *Associated Press* article claimed the Internet Division was being phased out, IBM denied this. The future of the division will depend on how well its products are received, Wladawsky-Berger said. The division's size and function are flexible, and he said he expects the group to evolve over time. He believes IBM has made "huge progress" over the past 18 months in fulfilling its Internet objectives.

What has the division done that is a quantifiable success? If nothing else, it has gotten people thinking about IBM as a serious contender in the Web marketplace, said Robin Layland of Layland Consulting in West Hartford, Conn. "Have they really sold more products? It's hard to say. Has it been a blockbuster? I don't know if anybody has been a blockbuster. Everybody is trying to figure out how to make money on the Web. But they've gotten people to consider them, and that's a first step," he said.

Wladawsky-Berger said he believes there is virtually no limit to the uses of the Internet for business. "It's going to be huge," he said. "It's going to permeate everything. It's going to be a ubiquitous channel for doing commerce." ■

Now the power of

can fit any company. And



February 97 Remote Access Product of the Year January 97 1996 1996 1994 1995 Best Remote Access Product Best ISDN Product April 1996

☐ Yes! Please send me "A New Approach To Remote Access."

☐ Please send me information on the LanRover Power-Up series.

Complete and mail this card, or fax it to
508-788-1539 or call 1-800-977-4482.

Name ______
Title ______
Company ______
Address ______
City ______ State ______ Zip ______
Phone # ______ Fax# ______

How many remote users do you plan to support?
☐ 1-25
☐ 26-100
☐ 101-500
☐ 501+

When do you plan to implement a remote access solution?
☐ within 30 days
☐ 1-3 months
☐ 4-6 months
☐ 7-12 months
☐ 1+ year

How many employees at your site?
☐ 1-100
☐ 101-250
☐ 251-500
☐ 501-1000
☐ 1001-5000
☐ 5000+

Shiva®
The remote access specialists™
NW

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 1272 FRAMINGHAM, MA

POSTAGE WILL BE PAID BY ADDRESSEE

Shiva®

Shiva Corporation
PO Box 9345
Framingham, MA 01701-9940

LanRover

any budget.

```
  (__)
 qooP
  \_/
  | -
 || .
 ||
 ~~
```

The LanRover® POWER-UP SERIES is the first remote access system designed to fit the different needs of different organizations. Start with the basic, full featured, affordable LanRover. Then add a CONNECTIVITY KIT for advanced connectivity options. Or the SECURITY KIT for the most sophisticated data protection. Or the PERFORMANCE KIT, for the utmost in speed. For the ultimate system, choose the POWER SUITE, with all three kits. Upgrading to any kit is easy. You just activate features using unique, Internet-based digital keys. To receive a free copy of "A New Approach To Remote Access" and for more information about our 30-day risk free purchase, call us at 1-800-977-4482. Or visit our web site at www.shiva.com.

shiva.com

Shiva®

The remote access specialists™

The Shiva logo and LanRover are registered trademarks of Shiva Corporation. All other products and names are trademarks or registered trademarks of their respective owners.

Circle Reader Service **#17**

INTELLIGENT STORAGE FOR THE ENTERPRISE

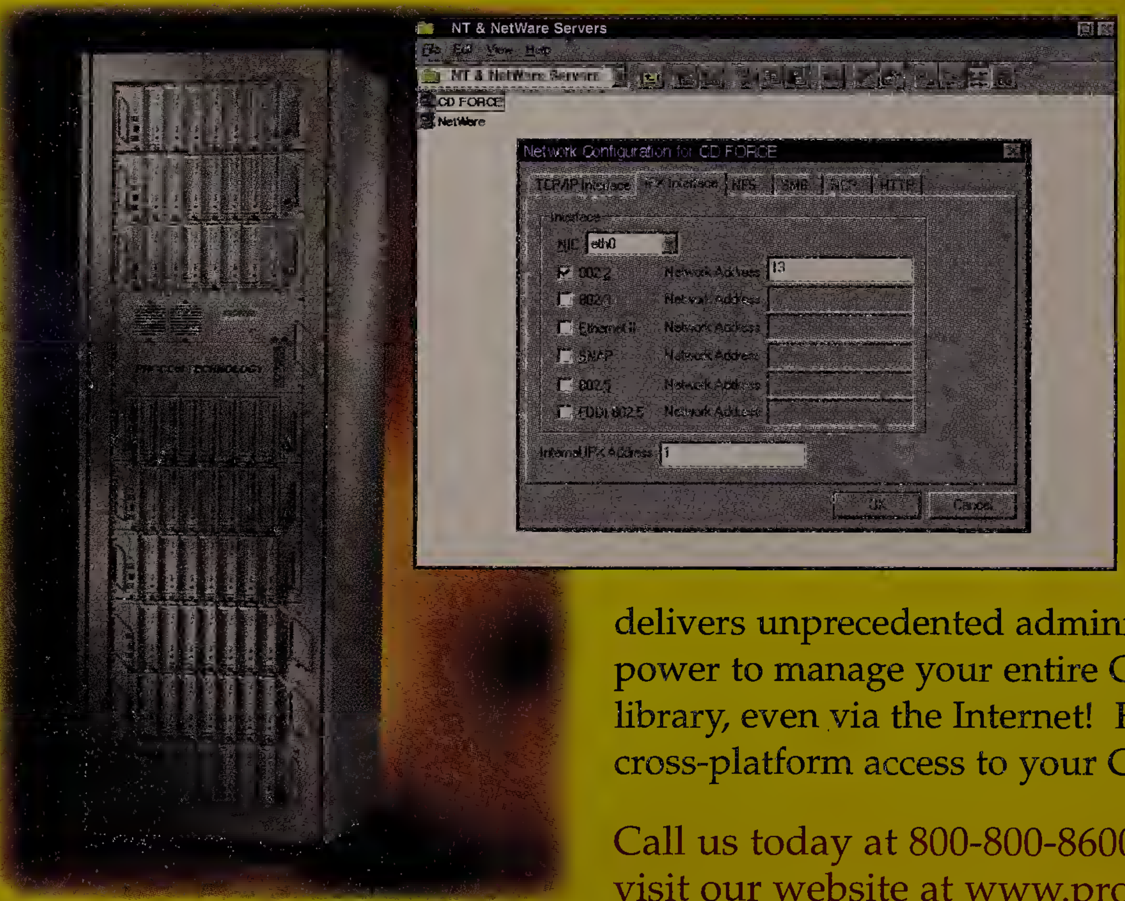
CD FORCE: The first cross-platform CD-ROM network storage system in the galaxy

www.procom.com/cdforce

Now your Windows NT, UNIX®, OS/2 and NetWare/IntraNetWare users can simultaneously access CD-ROMs with the same ease and performance using CD FORCE. Exclusive features of CD FORCE include:

- NEW! Compatibility with NT Domain Services
- NEW! Search & Execute applications and remote management using a Web Browser
- NEW! NDS support for NetWare/IntraNetWare clients

CD FORCE combines Procom's legendary, enterprise-strength CD networking systems with revolutionary embedded software. CD FORCE also delivers unprecedented administrative power to manage your entire CD-ROM library, even via the Internet! Finally, cross-platform access to your CD-ROMs.



CD FORCE provides centralized CD-ROM management across any network.

Call us today at 800-800-8600 x414 or visit our website at www.procom.com.

PROCOM TECHNOLOGY INC.
2181 Dupont Drive Irvine, California 92612
Tel: 800.800.8600 • Tel: 714.852.1000 • Fax: 714.261.7380
http://www.procom.com • E Mail: info@procom.com

PROCOM TECHNOLOGY

Microsoft Windows NT Compatible

yes It runs with NetWare

Circle Reader Service #25

INTERNETWORKING MONITOR

Defining the IP-SNA boundary

For most network managers, the issue of embracing TCP/IP is no longer one of "if," but rather "when." That means deciding where best to position IP in the net and where to define the boundary between existing SNA and IP.

Just because TCP/IP has won the hearts and minds of all mankind, courtesy of the Internet phenomenon, that does not mean it does a better job than SNA of servicing transaction-based traffic. It doesn't.

In fact, many so-called advanced IP features, such as class of service, have been standard in SNA for years.

The real issue, then, is how best to tactically integrate IP into existing SNA environments. Fundamentally, there are two choices, and the trade-offs are relatively straightforward. You can implement native TCP/IP stacks on SNA hosts — S/390 or AS/400 — or off-load the TCP/IP functionality to an IP-to-SNA gateway that sits in front of the SNA host and mediates between the host and TCP/IP clients.

Kevin Tolly

IBM for years has allowed native TCP/IP on mainframes and AS/400s.

Although early versions of TCP/IP subsystems did not receive rave reviews, by all accounts they've gotten better. But there are still issues worth considering.

Cost, for one, is a concern. While the basic host operating system may come bundled with the TCP/IP stack itself, useful applications may not. Without File Transfer Protocol (FTP), telnet and other functionality, a TCP/IP implementation is essentially useless.

Given the relatively high costs of license and maintenance fees for IBM host systems, the add-ons necessary to make the system even marginally useful could add significantly to costs on a recurring basis.

CPU cycle costs are another issue. The TCP/IP subsystem can consume an inordinate amount of pricey CPU resources just implementing a basic FTP server. The minimal functionality gained might not justify the price.

Early on, IBM began taking the front-end processor approach that worked so well with SNA and offered what was, in effect, a hardware assist to the host-based TCP/IP subsystem. In products such as the 3172, certain TCP/IP functions could be off-loaded from the mainframe to a less costly device.

The more common and functional approach is to off-load the entire TCP/IP set of functionality to a gateway running a multitasking operating system. The IP-to-SNA boundary is moved outside the host, which remains native SNA, while still providing functionality to TCP/IP client machines. This solves the previously noted problems of host-based TCP/IP and goes a step further.

The use of a common client/server computing platform allows sophisticated value-add functions to be integrated into the environment.

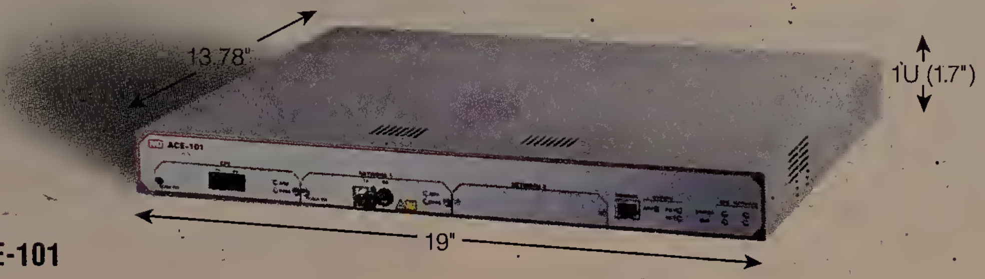
Whether the function is a 3270-to-HTML translator or an FTP-to-Advanced Program-to-Program Communications file transfer converter, the level of functionality is virtually guaranteed to be higher than what is offered in the native host implementation.

Tolly is president of The Tolly Group, a strategic consulting and independent testing firm in Manasquan, N.J. He can be reached at (732) 528-3300 or via the Internet at ktolly@tolly.com or www.tolly.com.

Headline:

ATM WAN access made simple

Photo:

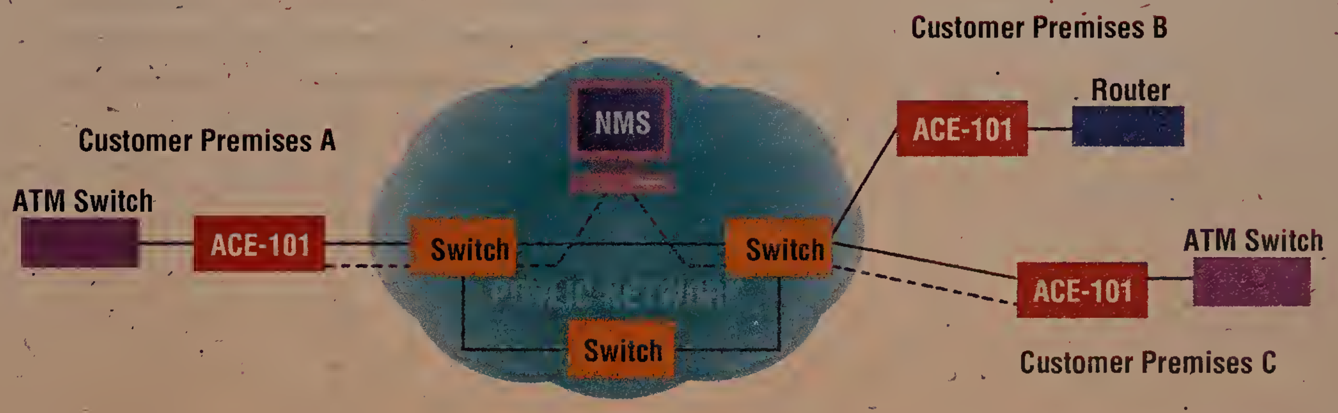


Product name: ACE-101

Product description: ATM Network Termination Unit

Product benefit: Connects private ATM networks to public ATM services, assuring end-to-end control and management of customer traffic across carrier networks. Extends the service providers management capacity all the way to the customer premises. Clearly defines responsibility between the user and carrier. Provides QoS, continuity check, performance management, loopback, and fault localization. Supports T3/E3, STM-1/STS-3c, and rate and media conversion.

Contact: Toll free 1-800-444-7234 or
market@radusa.com
web: http://www.rad.com



Boring ads. Brilliant solutions.

RAD
data communications

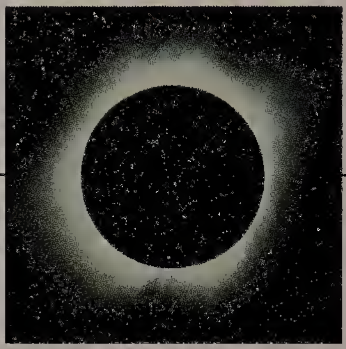
ISO 9000,9001,9002 Approved
GSA#: East GS-35F-3014D West GS-35F-3233D

RAD Data Communications, Inc.
e-mail: market@radusa.com. Toll Free: 1-800-444-7234
U.S. Headquarters: 900 Corporate Drive, Mahwah, NJ 07430 Tel: 201/529-1100 Fax: 201/529-5777 Midwest: Tel: 847/342-9999 Fax: 847/342-9986
West Coast: Tel: 714/897-2448 Fax: 714/891-1764 International Headquarters: 8 Hanechoshet Street, Tel Aviv 69710 Israel Tel: 972-3-6458181 Fax: 972-3-6498250

Circle Reader Service #26

Once, choosing a browser was a no-brainer.
Now it's a strategy.

When you put Microsoft® Internet Explorer 3 on everyone's desktop, you unify your intranet around one browser, optimized for each platform, bringing you more content and more control. And as you put your strategy into place, you can already see where it's going: Internet Explorer 4.



That's when the active desktop arrives, where applications, communications and the known universe merge on one window. When you can push your own channels of critical business information straight to every user's desktop. Adding management tools and communication capabilities that don't even have buzzwords yet. There's nothing amorphous about the future. Internet Explorer 3 is going to take you straight to Internet Explorer 4. So go to www.microsoft.com/ie/ and launch your strategy.

Where do you want to go today?®

www.microsoft.com/ie/

©1997 Microsoft Corporation. All rights reserved. Microsoft and Where do you want to go today? are registered trademarks and the Microsoft Internet Explorer logo is a trademark of Microsoft Corporation.

Directories in network management

Directories to the rescue

By Jim Duffy

To the point

Today's management directories are point solutions.

IP address management
- ▶ Support dynamic IP networks
- ▶ Reduce IP address management costs

Software distribution
- ▶ Automate desktop configuration
- ▶ Reduce system recovery costs

Access control
- ▶ Standardize security policies
- ▶ Reduce user password administration costs

SOURCE: IDC, FRAMINGHAM, MASS.

As networks grow, directories may let network managers' fingers walk a little faster.

Directory services could prove to be the key integration agent in network management by serving as a repository of data that spells out the relationships among network addresses, virtual LAN membership, service level guarantees and security policies. The only potential stumbling block is the lack of a standard for binding disparate directories.

"A corporatewide directory service is the foundation for the efficient control of network, system and user management," says Rick Villars, director of the network architectures and management practice of Framingham, Mass.-based International Data Corp.

Users agree. "Directory services are obviously going to dominate real soon," says Doyle Friskney, director of communications and network systems at the University of Kentucky in Lexington. They are going to be particularly important when it comes to managing multimedia and video, Friskney says.

"The next generation of global directory services will be the key enabler for the realization of smart networks," says Jeff Lukowsky, business manager in Digital Equipment Corp.'s Network Products Business unit. "I think of them as the intelligent control point from which policy-based management will be [delivered]."

In terms of network management, directories can be used to store information about virtual private networks (VPN), VLANs and IP addresses, Villars says. The directory can even be used to keep a roster of VPN users dialing in to the corporate network from remote sites.

Directories also can store information about network device ports, addresses and user IDs so users can be assigned to specific VLAN segments. For IP address management, directories can tie IP addresses to VLANs and keep track of the addresses assigned by Dynamic Host Configuration Protocol (DHCP) servers.

In systems management, directories can locate file and print servers, and log systems inventory and software configurations. Directories also can make sense out of the proliferation of user passwords, maintain access control policies and decide who gets past a firewall and who doesn't.

Vendors have begun to recognize the importance of directories in network management. Cisco Systems, Inc. and Microsoft Corp., for example, are working to bind information about Cisco's products with the upcoming Windows NT 5.0 Active Directory services.

Bay Networks, Inc. recently acquired Isotro Network Management, Inc., an Ottawa-based developer of IP address management and directory software, to begin development of its network services software.

Cisco's Stephen DeWitt, vice president and general manager of the company's network management operations, says Microsoft's Active Directory will play a significant role in binding network clients to the network services offered in Cisco's Internetwork Operating System software.

Cisco and Microsoft are working on an extended directory schema that will be used to register information on the characteristics of routers and bridges. Cisco plans to submit this schema to a standards body so other hardware vendors can eventually use it to register their devices inside directory services.

Netscape Communications Corp. is trying to recruit a host of network equipment vendors to register their products inside Netscape's Lightweight Directory Access Protocol (LDAP)-based directory. And Novell, Inc. officials — who say they are in preliminary talks with several hardware device vendors — are positioning Novell Directory Services (NDS) as well-suited for more network management chores.

Digital is developing APIs and tool sets to integrate its products, including its network management software, into directories such as Active Directory and NDS.

Query nation

If dependencies between network devices are defined inside a directory, network management and modeling tools can easily query it for probable cause and effect relationships. The directory/device linkage also can be used to enforce policies dictating user access and security privileges to network access and quality of service, DeWitt says.

But before the industry can reach this network nirvana, a number of hurdles must be overcome. Today, information on network devices, systems and users is stored in multiple nonsynchronized and incompatible databases, Villars says. There is no coordination of information, which leads to inefficient processes for adds, moves and changes, he says.

Compatibility between directories is Priority 1 with some users.

"Inventory management has been a real problem," says Roy Hegge, senior network engineer at ADC Telecommunications, Inc. in Minneapolis. "There's a lot of proprietary schemes for hooking inventory management to network management. It'd be nice to see something standardized based on LDAP or something like that."

Also, most directory products on the market today are targeted at specific problems. IP address management companies do not address system or user management. Companies that develop software distribution products do not concern themselves with network or user management. And vendors of access control products, such as firewalls, do not take into account network device or system configuration information, Villars asserts.

That problem may be compounded by the fact that there is no standard to tie these disparate directories together. Several IP address management vendors are eyeing LDAP as a uniform method for melding DHCP server data (*NW*, June 30, page 21). But again, that is a network-centric problem and solution; LDAP is not being considered within the context of system or user management.

One company attempting to resolve the multiple directory mess is Zoomit Corp. of Toronto. Zoomit makes a so-called metadirectory, software that joins the contents of several directories so they can be viewed, managed and changed without changing the way any of the separate directories work.

The final conflict

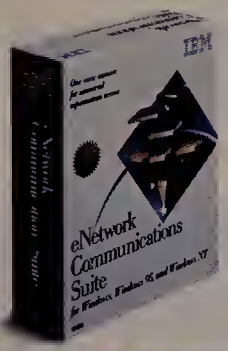
The final obstacle to the rapid adoption of directories in enterprise management is corporate politics. No matter how much sense it might make to combine directories within a corporation, there is bound to be some organizational resistance.

"One of the big challenges is organizational," Villars says. "There's not a history of cooperation and sharing across [corporate] groups. This is a bigger challenge than the technical challenge."

"Directories were never on CIOs' radar screen," Lukowsky says. "But as soon as you start moving to the intranet and you want seamless integration to the Internet, directories suddenly began to expose themselves as a serious issue."

Indeed, a large investment bank in New York is saving $10 million a year by integrating its cross-organizational directories into a giant management data repository, according to Villars. But if the potential cost savings isn't enough of a push, a company's suppliers might direct it towards integrated directories.

"It's going to be through the network equipment people that a lot of [companies] that have shied away are going to be pulled into directories," Villars says. ■



IBM

Solutions for a small planet™

IBM eNetwork™ Communications Suite provides
access to users anywhere, over virtually any network.

IBM, eNetwork, AS/400 and Solutions for a small planet are trademarks of International Business Machines Corporation in the United States and/or other countries. Lotus and Notes Mail are trademarks of Lotus Development Corporation in the United States and/or other countries. Java is a trademark of Sun Microsystems, Inc. Microsoft, Windows and Windows NT are registered trademarks of Microsoft Corporation. Other company, product and service names may be trademarks or service marks of others. © 1997 IBM Corp. All rights reserved.

Universal access for a universe of users. IBM eNetwork Communications Suite gives you the power to provide access to users anywhere, over virtually any network. Now you can leverage your existing IT assets by extending the reach of your network while enjoying the same bulletproof integrity you built into your enterprise network infrastructure. And with a series of best-in-class components, you can standardize your users while satisfying their individual needs. Try it for yourself. It's the enterprise-class solution to universal access. Call 1 800 901-2205, code 6C7BJ003, or visit www.software.ibm.com/access for the no-charge Communications Suite Evaluation Kit, and to take advantage of limited-time introductory prices.

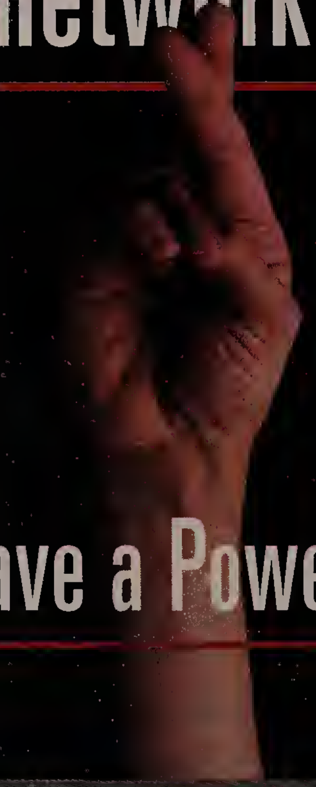
eNetwork Communications Suite

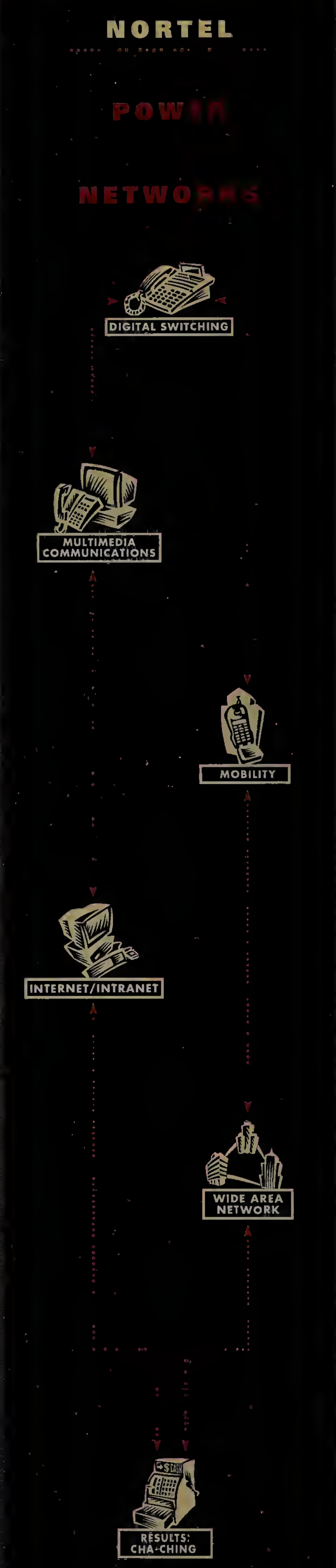
IBM Personal Communications: AS400,® 3270, 5250, VT52, VT100, VT220, VT320 and more
Lotus® Notes Mail®: Client/server messaging and popular Netscape compatible plug-ins
FTP Software: 32-bit TCP/IP protocol stack and Internet applications
Netscape Navigator: Web browser with support for frames, Java™ and SSL security

Supports Microsoft® Windows® Version 3.1, Windows 95, Windows NT® 4.0.
One-company support for all of the above to make IT life a little simpler.

NORTEL
NORTHERN TELECOM

Do you have faith in your network?





Do you have a Power Network™?

Let's face it, you and your network are sort of joined at the hip. It succeeds. So do you. Which is why you need a network you can trust. A Nortel Power Network can transform your disparate legacy networks – data, voice, video – into an integrated multimedia network that's more cost-effective, flexible and, yes, more reliable. So think Power Network and keep the faith.

For an evaluation of your network, contact us today. 1-800-4NORTEL, department 168C or www.nortel.com/168C.

©1997 Northern Telecom. Power Networks, Nortel and the Nortel globemark are trademarks of Northern Telecom.

Circle Reader Service **#13**

APPLICATION FOR FREE SUBSCRIPTION

NetworkWorld

THE NEWSWEEKLY OF ENTERPRISE NETWORK COMPUTING

☐ **Yes!** I want to receive/continue to receive my FREE subscription to *Network World*.

☐ No. Thank You.

Do you wish to receive Intranet Magazine FREE? (It will be a monthly publication with content similar to the Intranet supplement within *Network World*.) ☐ Yes ☐ No

Sign Here

Signature (required) Date

To qualify: You must supply your company name and address. Please Print Clearly.

Name ______________________ Title ______________________

Company ______________________

Street address ______________________

City ______________________ State ________ Zip ________

Business phone (_____) ______________________ Business FAX (_____) ______________________

Internet e-mail address ______________________

If there is a parent company, please provide name: ______________________

If military, please specify branch and base: ______________________

If government, please specify division: ______________________

☐ My home address is also my business address.

Optional delivery address:

Enter your home address below if your company will not accept delivery at your business address:

Street address City State Zip

Publisher reserves the right to serve only those individuals who meet publication qualifications.
ALL questions must be answered. Incomplete forms will not be processed.
Free subscriptions available to qualified US applicants. Foreign and Canadian rates available upon request.

Form: 9702

1 What is the principal business activity at your location? (check one only)

01. ☐ Manufacturing (other)
02. ☐ Finance/Banking
03. ☐ Insurance/Real Estate/Legal
04. ☐ Health Care Services
05. ☐ Hospitality/Entertainment/Recreation
06. ☐ Media/TV/Cable/Radio/Print
07. ☐ Retail/Wholesale Trade/Business Services
08. ☐ Transportation
09. ☐ Utilities
10. ☐ Education
11. ☐ Process Industries (Mining/Construction/ Petroleum Refining/Agriculture/Forestry)
12. ☐ Government (Federal/State/Local)
13. ☐ Military
14. ☐ Aerospace
15. ☐ Consulting (Independent)*
16. ☐ Carriers/Interconnects
17. ☐ Internet Service Provider (ISP)
18. ☐ Manufacturing (Computer/Communications/OEM)
19. ☐ Resellers of Computer/Network Products (VARs, AVADs)
20. ☐ Systems/Network Integrators*
21. ☐ Distributors (Computer/Communications)*
22. ☐ Other *(please specify)*

***Please complete form based on largest client.**

2 What is your job function? (check one only)

NETWORK IS MANAGEMENT:

1. ☐ Network Management
2. ☐ LAN Management
3. ☐ Datacom/Telecom Management
4. ☐ IS, IT, MIS, CIO, Systems Management
5. ☐ Internet/Intranet Management/Webmaster
6. ☐ Engineering Management
7. ☐ Corporate Management (CEO, Pres., VP, Dir., Mgr., Financial Management)
8. ☐ Consultant (Independent)
9. ☐ Other *(please specify)*______________

3 What is the estimated value of Network equipment and services that you specify, recommend or approve the purchase of? (Please **print** the appropriate **number code** in the box next to each product category. Please complete ALL categories A-M.)

1. $50 Million or more
2. $25 Million to $49.9 Million
3. $10 to $24.9 Million
4. $1 to $9.9 Million
5. $100,000 to $999,999
6. $50,000 to $99,999
7. Under $50,000
8. None of the above

A ☐ Large Systems *(Mainframes/Minis)*
B ☐ Desktops *(Micros/Laptops/Workstations)*
C ☐ Servers
D ☐ LANs
E ☐ WAN Equipment
F ☐ Carrier Services
G ☐ Internetworking
H ☐ Internet
I ☐ Intranet
J ☐ Remote Access
K ☐ Peripherals
L ☐ Software
M ☐ Service/Support

4 What is the total number of sites for which you have purchase influence? (check one only)

1. ☐ 100+ 2. ☐ 50 - 99 3. ☐ 20 - 49 4. ☐ 10 - 19 5. ☐ 2 - 9 6. ☐ 1 7. ☐ None

5 What is the total number of Servers/Clients/LANs installed/planned at your location/in your entire organization? (Check one box in each column)

SERVERS At Location A		SERVERS Entire Org. B	CLIENTS At Location C		CLIENTS Entire Org. D	LANS At Location E		LANS Entire Org. F
☐	1. 50,000+	☐	☐	1. 50,000+	☐	☐	1. 50,000+	☐
☐	2. 10,000 to 49,999	☐	☐	2. 10,000 to 49,999	☐	☐	2. 10,000 to 49,999	☐
☐	3. 1,000 to 9,999	☐	☐	3. 1,000 to 9,999	☐	☐	3. 1,000 to 9,999	☐
☐	4. 100 to 999	☐	☐	4. 100 to 999	☐	☐	4. 100 to 999	☐
☐	5. 50 to 99	☐	☐	5. 50 to 99	☐	☐	5. 50 to 99	☐
☐	6. 10 to 49	☐	☐	6. 10 to 49	☐	☐	6. 10 to 49	☐
☐	7. 1 to 9	☐	☐	7. 1 to 9	☐	☐	7. 1 to 9	☐
☐	8. none	☐	☐	8. none	☐	☐	8. none	☐

6 What is your scope and involvement in purchasing decisions for network products and services for your enterprise?

A. Scope (check one only)
1. ☐ Corporate/Enterprise
2. ☐ Department
3. ☐ None

B. Involvement (check ALL that apply)
1. ☐ Create Network Strategy
2. ☐ Recommend/Specify
3. ☐ Approve
4. ☐ Evaluate
5. ☐ Determine the need
6. ☐ None

7 What is the estimated number of employees at your location/in entire organization? (check one in each section)

A. At your location:
1. ☐ Over 20,000
2. ☐ 10,000 - 19,999
3. ☐ 5,000 - 9,999
4. ☐ 2,500 - 4,999
5. ☐ 1,000 - 2,499
6. ☐ 500 - 999
7. ☐ 499 or less

B. Entire organization:
1. ☐ Over 20,000
2. ☐ 10,000 - 19,999
3. ☐ 5,000 - 9,999
4. ☐ 2,500 - 4,999
5. ☐ 1,000 - 2,499
6. ☐ 500 - 999
7. ☐ 499 or less

8 Please indicate the products/services that you are currently involved in purchasing or plan to purchase: (Check ALL that apply)

A. Currently involved in purchasing **B. Plan to purchase**

INTERNET/INTRANET

A B
☐ 01. ☐ Internet Services
☐ 02. ☐ Firewalls/Security/Encryption
☐ 03. ☐ Internet Web Servers
☐ 04. ☐ Intranet Web Servers
☐ 05. ☐ TCP/IP Software
☐ 06. ☐ Management/Monitoring Software
☐ 07. ☐ Push Technology
☐ 08. ☐ Web Browsers
☐ 09. ☐ Intranet Applications/Groupware
☐ 10. ☐ Search/Retrieval Products (web crawler)
☐ 11. ☐ Internet Development Tools (JAVA, ActiveX, etc.)
☐ 12. ☐ Electronic Commerce Tools
☐ 13. ☐ Internet Telephony

LOCAL-AREA NETWORKS

A B
☐ 14. ☐ Local-Area Networks
☐ 15 ☐ Network Operating System Software
☐ 16. ☐ Servers
☐ 17. ☐ Print Servers
☐ 18. ☐ ATM Switches
☐ 19. ☐ Token-Ring Switches
☐ 20. ☐ Ethernet Switches
☐ 21. ☐ Fast Ethernet
☐ 22. ☐ Gigabit Ethernet
☐ 23. ☐ IP Switches
☐ 24. ☐ LAN Storage/Backup
☐ 25. ☐ Optical LAN Storage/Backup
☐ 26. ☐ Disk LAN Storage/Backup
☐ 27. ☐ Tape LAN Storage/Backup
☐ 28. ☐ RAID LAN Storage/Backup
☐ 29. ☐ Network Test/Diagnostic Tools
☐ 30. ☐ Cables, Connectors, Baluns
☐ 31. ☐ UPS
☐ 32. ☐ Network Interface Cards
☐ 33. ☐ SNMP Network Management

INTERNETWORKING

A B
☐ 34. ☐ Routers
☐ 35. ☐ Hubs
☐ 36. ☐ Intelligent Hubs
☐ 37. ☐ Stackable Hubs
☐ 38. ☐ Bridge/Router
☐ 39. ☐ Bridges
☐ 40. ☐ Gateways
☐ 41. ☐ Concentrators/Repeaters

COMPUTERS/PERIPHERALS

A B
☐ 42. ☐ Network Computers
☐ 43 ☐ Laptops/Notebooks/Sub-Notebooks
☐ 44. ☐ Micros/PCs
☐ 45. ☐ Minis
☐ 46. ☐ Mainframes
☐ 47. ☐ Workstations
☐ 48. ☐ Printers/Network Printers
☐ 49. ☐ CD-ROM
☐ 50. ☐ Fax/Modem Boards
☐ 51. ☐ Graphics/Multimedia/Audio/Video Boards
☐ 52. ☐ Memory/Chips/Boards/Cards

REMOTE/WIRELESS COMPUTING

A B
☐ 53. ☐ Remote Access Products
☐ 54. ☐ Remote Access Services
☐ 55. ☐ PDAs
☐ 56. ☐ PCMCIA Devices
☐ 57. ☐ Wireless Data Services
☐ 58. ☐ Wireless Data Equipment
☐ 59. ☐ Cellular Equipment & Services

SOFTWARE/APPLICATIONS

A B
☐ 60. ☐ Network Management
☐ 61. ☐ Systems Management
☐ 62. ☐ Security
☐ 63. ☐ Communications Software
☐ 64. ☐ Terminal Emulation
☐ 65. ☐ Operating Systems
☐ 66. ☐ Applications Development Tools
☐ 67. ☐ Database Management/RDBMS
☐ 68. ☐ Groupware
☐ 69. ☐ Workflow
☐ 70. ☐ EDI
☐ 71. ☐ E-mail
☐ 72. ☐ Desktop Video Conferencing
☐ 73. ☐ Imaging
☐ 74. ☐ Suites/Server Suites (Back Office, etc.)
☐ 75. ☐ Middleware
☐ 76. ☐ Document Management
☐ 77. ☐ Site Metering Tools
☐ 78. ☐ Computer Telephony Integration (CTI)
☐ 79. ☐ Data Warehousing

WIDE-AREA NETWORK EQUIPMENT & SERVICES

A B
☐ 80. ☐ Modems
☐ 81. ☐ Asynchronous Transfer Mode (ATM)
☐ 82. ☐ Frame Relay Equipment/Services
☐ 83. ☐ ISDN Equipment & Services
☐ 84. ☐ FT-1/T-1/T-3 Multiplexers/Services
☐ 85. ☐ DSL Services/Products
☐ 86. ☐ SONET
☐ 87. ☐ Inverse Multiplexers
☐ 88. ☐ SMDS
☐ 89. ☐ Diagnostic/Test Equipment
☐ 90. ☐ DSU/CSU
☐ 91. ☐ VSAT/Satellite
☐ 92. ☐ PBXs
☐ 93. ☐ Voice Mail/Response
☐ 94. ☐ Videoconferencing
☐ 95. ☐ Leased Lines
☐ 96. ☐ Switched Data
☐ 97. ☐ Virtual Networks
☐ 98. ☐ Outsourcing/Systems Integration Services
☐ 99. ☐ Education/Training Services

☐ 00. ☐ None of the above (1 - 99)

9 Please indicate the platforms that are currently installed/planned:

(Check ALL that apply) **A. Currently installed** **B. Planned for purchase**

NETWORK PROTOCOLS

A B
☐ 01. ☐ TCP/IP
☐ 02. ☐ IPv6
☐ 03. ☐ SNA
☐ 04. ☐ DECnet
☐ 05. ☐ Novell IPX/SPX
☐ 06. ☐ APPC/APPN/LU 6.2
☐ 07. ☐ NETBIOS
☐ 08. ☐ AppleTalk
☐ 09. ☐ NFS
☐ 10. ☐ Other *(please specify)*______________

LAN ENVIRONMENT

A B
☐ 11. ☐ Gigabit Ethernet
☐ 12. ☐ Switched Ethernet
☐ 13. ☐ Fast Ethernet (100 Megabit Ethernet)
☐ 14. ☐ Ethernet
☐ 15. ☐ ATM
☐ 16. ☐ Token Ring/Token Ring Switching
☐ 17. ☐ IP Switching
☐ 18. ☐ FDDI
☐ 19. ☐ 100Base-T
☐ 20. ☐ 10Base-T
☐ 21. ☐ LocalTalk
☐ 22. ☐ Fibre Channel
☐ 23. ☐ 100vg Any LAN
☐ 24. ☐ Other *(please specify)*______________

NETWORK OPERATING SYSTEM

A B
☐ 25. ☐ Windows NT
☐ 26. ☐ Windows NT/Advanced Server
☐ 27. ☐ Novell IntranetWare
☐ 28. ☐ Novell (NetWare 4.X)
☐ 29. ☐ Novell (NetWare 2.X, 3.X)
☐ 30. ☐ Microsoft (LAN Manager)
☐ 31. ☐ LocalTalk (AppleTalk)
☐ 32. ☐ Banyan (VINES)
☐ 33. ☐ IBM (LAN Server)
☐ 34. ☐ Artisoft (LANtastic)
☐ 35. ☐ Other *(please specify)*______________

COMPUTER OPERATING SYSTEM

A B
☐ 36. ☐ NT Server
☐ 37. ☐ NT Workstation
☐ 38. ☐ Unix/Xenix/AIX
☐ 39. ☐ Solaris
☐ 40. ☐ Windows
☐ 41. ☐ Windows 95
☐ 42. ☐ Windows 97
☐ 43. ☐ DOS
☐ 44. ☐ OS/2/OS/2 Warp
☐ 45. ☐ IBM MVS/VM/VSE
☐ 46. ☐ Digital VMS
☐ 47. ☐ Macintosh
☐ 48. ☐ Other *(please specify)*______________

☐ 49. ☐ None of the above (1-48)

10 Which of the following Servers/Clients do you have installed/planned at your location? (check ALL that apply in each column)

		A. Servers	B. Clients
01.	Power PC	☐	☐
02.	Power Mac	☐	☐
03.	Mac Other	☐	☐
04.	Multiprocessor Servers	☐	☐
05.	P6/PII	☐	☐
06.	Pentium/Pentium Pro	☐	☐
07.	486	☐	☐
08.	386	☐	☐
09.	286	☐	☐
10.	Risc	☐	☐
11.	Alpha	☐	☐
12.	Other	☐	☐

11 Which of the following hardware platforms are installed/planned in your company? (check ALL that apply)

A - Mainframes (Large Scale) Installed/Planned
1. ☐ IBM
2. ☐ Amdahl
3. ☐ Cray
4. ☐ Hitachi
5. ☐ Unisys
6. ☐ Other ______________

B - Minis (Midrange) Installed/Planned
1. ☐ IBM RS6000
2. ☐ IBM AS400
3. ☐ Digital
4. ☐ Tandem
5. ☐ Unisys
6. ☐ AT&T GIS
7. ☐ H-P
8. ☐ Data General
9. ☐ Other ______________

C - Workstations Installed/Planned
1. ☐ Sun Microsystems
2. ☐ Silicon Graphics
3. ☐ Digital
4. ☐ H-P
5. ☐ IBM
6. ☐ Other ______________

12 What is the estimated gross annual revenue of your entire company/institution? (check one only)

01. ☐ $20 billion or more
02. ☐ $10 billion to $19.9 billion
03. ☐ $1 billion to $9.9 billion
04. ☐ $500 million to $999.9 million
05. ☐ $100 million to $499.9 million
06. ☐ $50 million to $99.9 million
07. ☐ $10 million to $49.9 million
08. ☐ $5 million to $9.9 million
09. ☐ $4.9 million or less
10. ☐ None of the above

13 For which areas outside of North America do you have purchase influence? (check ALL that apply)

1. ☐ Europe 2. ☐ Asia 3. ☐ South America 4. ☐ Australia 5. ☐ Middle East 6. ☐ None

Please indicate the names and job functions of other individuals at your location to whom you would like us to send a copy of NetworkWorld.

Name ______________________ Job Function ______________________

Name ______________________ Job Function ______________________

Name ______________________ Job Function ______________________

Name ______________________ Job Function ______________________

Name ______________________ Job Function ______________________

Name ______________________ Job Function ______________________

Name ______________________ Job Function ______________________

Visit our Web Information Service, *Network World Fusion*™ and apply on-line at http://www.nwfusion.com

1. FOLD HERE & MAIL TODAY

▼

▲

3. PLEASE TAPE HERE

2. FOLD HERE & MAIL TODAY

▼

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST-CLASS MAIL PERMIT NO 1752 NORTHBROOK IL

POSTAGE WILL BE PAID BY ADDRESSEE

NetworkWorld

THE NEWSWEEKLY OF ENTERPRISE NETWORK COMPUTING

PO BOX 3091
NORTHBROOK IL 60065-9928

Carriers & ISPs

Covering: The Internet • Interexchange and Local Carriers •
Wireless • Regulatory Affairs • Voice Equipment

Briefs

■ *The* **Department of Justice's Antitrust Division** *has started a review of* **Lucent Technologies, Inc.'s** *proposed takeover of its leading voice messaging rival, Octel Communications Corp. Lucent said the government's request for detailed information is "not unusual in these circumstances" and that the two companies are "confident that the acquisition will be completed." The review will likely slow the closing of the deal.*

■ *Looking for some free advice?* **Bell Atlantic Corp.** *recently published a guide for users looking to implement remote access programs at work.*

Large Business Services Bell Atlantic

Teleworking and Business Process Reengineering Consultation

Consulting Services To Make Teleworking . . . WORK

Bell Atlantic's *teleworking Web site.*

Bell Atlantic's **Electronic Guide to Teleworking Issues and Policies** *is available free on the company's Web site — www.bell-atl.com/largebiz/lb_html/telework.htm.*

■ *Network brownouts and downtime do not discriminate. Earlier this month,* **BBN Planet** *struggled to keep its network up after two manhole explosions in Cambridge, Mass., caused the network to go down. Although two* **BBN points of presence** *in Cambridge were unaffected, a third* **lost power** *and* **slowed traffic** *on BBN's Northeast network for about five hours. BBN was criticized for not having redundant power to keep its POPs up.*

■ **MCI Communications Corp.** *and* **Bell Canada** *announced availability of* **ATM service** *between the U.S. and Canada. It is limited to Ontario and Quebec, which Bell Canada serves directly.*

Frame relay with a twist of voice

MCI/BT joint venture set to roll out support for voice traffic on frame relay.

By Denise Pappalardo
Reston, Va.

Concert Communications is getting ready to sing the praises of voice over frame relay.

The British Telecommunications plc and MCI Communications Corp. joint venture is prepping its frame relay network in the Asia-Pacific region to support permanent virtual circuits (PVC) specifically engineered for voice.

Because the PVCs are designed to support low latency and low variable delay, voice quality is not expected to suffer.

Concert is following on the heels of Sprint Corp., which two weeks ago announced class-of-service parameters for its frame relay service, including guaranteed maximum end-to-end delay for SNA and voice traffic (*NW,* Aug. 4, page 6). However, Sprint's voice over frame relay offerings will not be available until the first quarter of next year.

Concert's voice PVC service will offer users a 64K bit/sec frame relay connection with guaranteed maximum round-trip delays lower than 200 to 300 msec, said Srini Krishnamurthy, product manager for Concert frame relay services.

"Minimizing delay as much as possible and trying to keep the variable delay down is important to the quality of voice over frame," said Jay Pultz, research director at Gartner Group, Inc., a Stamford, Conn.-based consultancy.

Although Concert's voice PVC service initially will be limited geographically, the company plans to roll out the service in Europe and then possibly in the U.S. Today, voice over frame relay still makes the most sense for companies with overseas interests, especially in the Asia-Pacific region where toll charges are high, said Rick Malone, principal of Vertical Systems Group, a Dedham, Mass.-based consultancy.

But the demand for voice over frame relay still exists domestically. While large companies can negotiate long-distance telephone rates down to 5 and 6 cents per minute, small to mid-size businesses cannot get those types of rates, Malone explained. These are the businesses that could benefit from using an existing data network to support voice.

The main reason domestic interexchange carriers (IXC) have not adopted voice over frame relay is because they do not want to jeopardize their circuit-switched network market share, according to Malone.

Frame relay switch manufacturers have made the capabilities available to support voice over frame relay, but the carriers have internal political issues to deal with, he added.

In fact, Concert is not deploying new software or hardware to support the new voice PVCs. It is instead taking advantage of the inherent class-of-service capabilities in its StrataCom, Inc. IGX switches, Krishnamurthy said.

Sprint's voice over frame relay class of service is a step in the right direction, analysts said, even though Sprint and other IXCs could have been supporting the capability months ago. MCI is offering its users some prioritization features for frame relay traffic, but it is not as in-depth as class of service (*NW,* Jan. 20, page 1).

MCI and AT&T are expected to follow suit with class-of-service guarantees by the end of 1998, Pultz said.

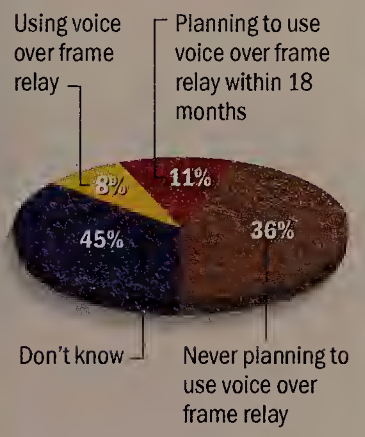
"It's inevitable," Malone said.

Pricing has not been set for Concert's voice PVC service, but Krishnamurthy said users most likely will pay $100 to $200 more per PVC compared with a standard 64K bit/sec PVC.

✆ Concert: (703) 707-4000

DO YOU HEAR WHAT I HEAR?

It isn't a mass market, but voice-over-frame relay service has piqued the interest of some customers.



Total respondents: 2,146

SOURCE: VERTICAL SYSTEMS GROUP, DEDHAM, MASS.

RBOCs get a chance to break out of the box

By David Rohde
Washington, D.C.

A little-noticed recent action by the Federal Communications Commission could cut costs for network managers who set up remote access programs for telecommuters.

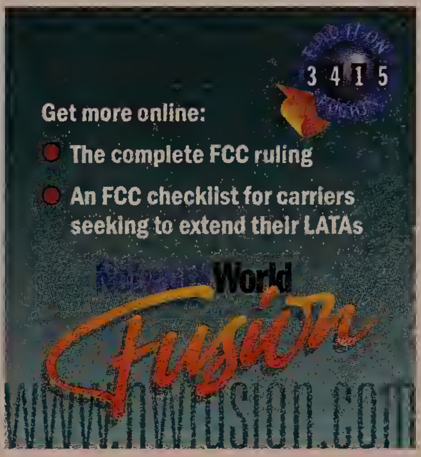
Over AT&T's objection, the FCC last month for the first time granted exceptions to regional Bell operating companies' calling area boundaries. Ordinarily, RBOCs are only allowed to carry voice and dial-up data connections within those boundaries, known as local access and transport areas.

The FCC ruled that on a case-by-case basis, RBOCs can cross a LATA boundary to carry calls if the area just beyond the boundary has a "community of interest" with the LATA's main cities and towns.

Branching out

The move may mean that users no longer have to pay tolls for dial-up connections from local telecommuters who live in the next LATA. According to analysts, this is occurring more often as sprawling metropolitan areas branch further into the countryside.

The FCC's move comes with a series of conditions. The RBOC can only offer inter-LATA calling service if everyone in the affected town outside the LATA automatically gets the service included in their regular monthly flat-rate plans.


3 4 1 5
Get more online:
● The complete FCC ruling
● An FCC checklist for carriers seeking to extend their LATAs
Network World
Fusion
www.nwfusion.com

As a result, users do not have to purchase a separate, higher priced service — often dubbed "metro lines" by RBOCs — to get the deal, said Bruce Thatcher, president of TelCon Associates, Inc., a telecom auditing firm in Overland Park, Kan. Such lines often cost three times as much as regular local phone lines, Thatcher said.

In addition, RBOCs must apply separately for each situation in which they want to authorize inter-LATA calling. It also must get approval for the plan from state regulators and submit a "Community of Interest Statement" justifying the commercial connection between the two LATAs.

Connection objection

AT&T complained that allowing RBOCs to cross LATA boundaries in effect puts them into the long-distance business before they have met the legal requirements of the telecom reform act. The FCC said limiting the authority to flat-rate service should assuage AT&T's concerns.

There is one catch, Thatcher noted. The FCC is allowing RBOCs to increase flat-rate fees to all users as a result of extending the local calling service.

"As local calling areas get bigger, then all other things being equal, the cost of telephone service will increase," Thatcher said. ■

EYE ON THE CARRIERS

Swords may turn into plowshares before rates drop

Secretary of State Madeleine Albright may have an easier time restarting Middle East peace negotiations than the Federal Communications Commission will have bringing down international telephone rates.

With typical ballyhoo, outgoing FCC Chairman Reed Hundt at the last minute rushed onto the FCC's August meeting agenda an item dealing with international settlement rates. These are the grossly inflated fees U.S. carriers must pay to foreign carriers — usually government-owned monopolies — to terminate their calls overseas.

Last December, the FCC proposed to mandate that those rates come down from a weighted average of 35 cents per minute to a range of 15 to 23 cents. If you're wondering how a U.S. government agency can tell a foreign carrier (in most cases, really a foreign government) what to do, you're onto something. The proposal generated a storm of protest, with dozens of foreign governments telling the FCC to mind its own business and let the International Telecommunication Union handle the matter.

In the meantime, U.S. officials in February convinced 65 of those countries to sign the World Trade Organization (WTO) telecommunications pact committing them to break up state-owned monopolies, which is the only sure way to break up the international telecom cartel. So for a while, the FCC let its settlement-rate proposal lie dormant.

David Rohde

Then earlier this month, President Clinton announced FCC staff lawyer Bill Kennard as his choice to succeed Hundt. Suddenly, the FCC slid the international settlement issue onto its meeting agenda for the very next day. The FCC is supposed to give one week of public notice except in an emergency. The international telecom situation may be a tragedy, but it's not an emergency.

With his departure date looming, Hundt pushed the commission to pass the measure and as usual called it a great day for America.

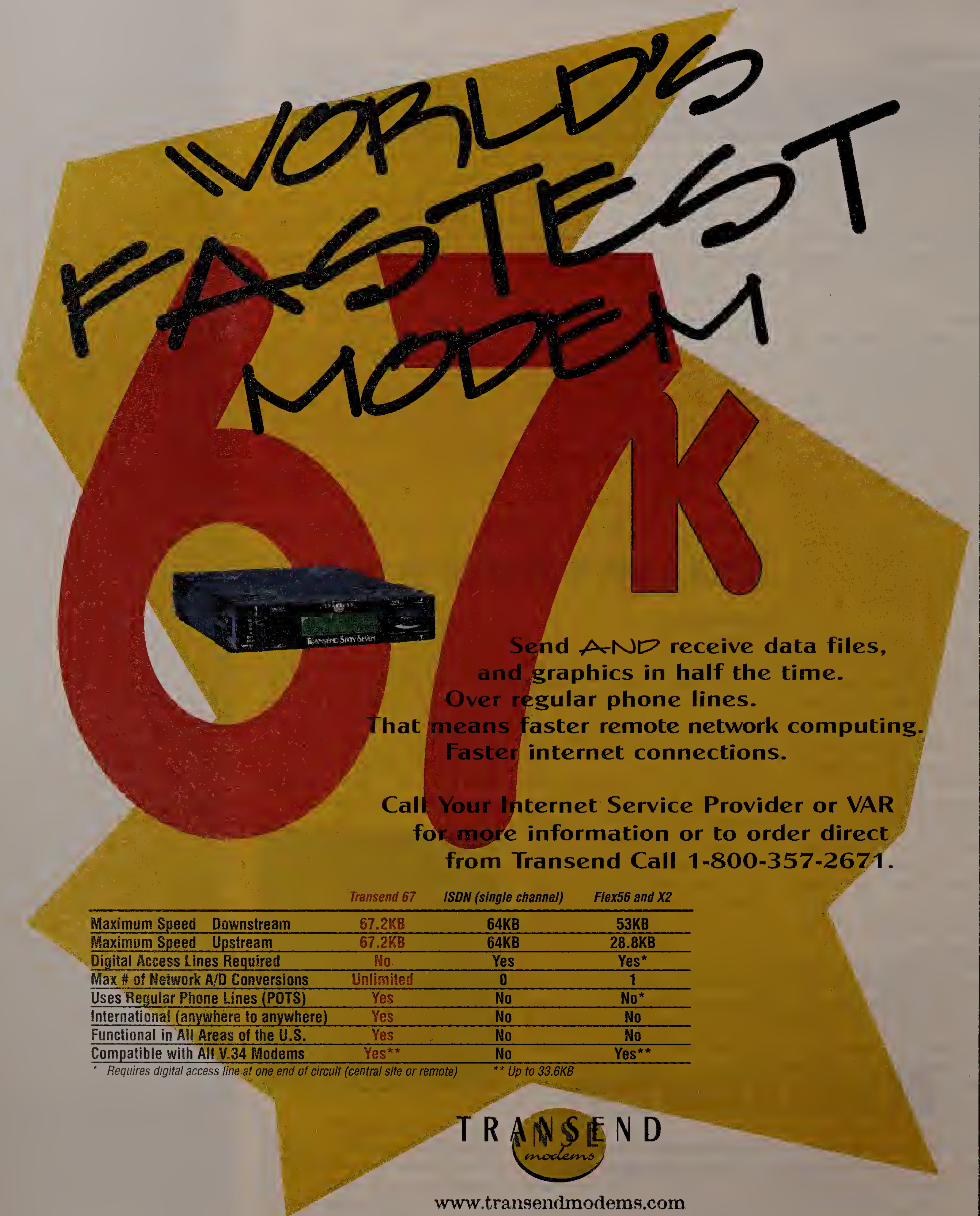
Well, sure, if the foreign carriers don't sue or retaliate by going back on their WTO commitments.

None of this excuses the foreign countries' telecom policies. It's true that a few countries have brought their settlement rates way down. Sweden, for example, now charges only 8 cents per minute to U.S. carriers.

But many others charge ridiculous rates, such as Indonesia's $1.20 per minute, basically to get U.S. users to subsidize their telecom infrastructure build-outs. U.S. officials are absolutely justified in protesting such policies and working as hard as possible to get them changed.

But once more, Hundt's typically boastful and transparently political method of rushing through a proposal and exaggerating its likely benefits could make it less likely that U.S. carriers and users will get their way. Especially by circumventing the FCC's usual rules for public disclosure of impending decisions, he gave foreign carriers one more legal argument for overturning it.

Rohde is Network World's *senior editor of Carriers and ISPs. He can be reached at david_rohde@nww.com.*



Send AND receive data files, and graphics in half the time.
Over regular phone lines.
That means faster remote network computing.
Faster internet connections.

Call Your Internet Service Provider or VAR for more information or to order direct from Transend Call 1-800-357-2671.

	Transend 67	ISDN (single channel)	Flex56 and X2
Maximum Speed Downstream	67.2KB	64KB	53KB
Maximum Speed Upstream	67.2KB	64KB	28.8KB
Digital Access Lines Required	No	Yes	Yes*
Max # of Network A/D Conversions	Unlimited	0	1
Uses Regular Phone Lines (POTS)	Yes	No	No*
International (anywhere to anywhere)	Yes	No	No
Functional in All Areas of the U.S.	Yes	No	No
Compatible with All V.34 Modems	Yes**	No	Yes**

* Requires digital access line at one end of circuit (central site or remote) ** Up to 33.6KB

TRANSEND modems

www.transendmodems.com

ISP/VAR Partner Hotline: 1-800-654-0623

Circle Reader Service #20

Intranet Applications

Covering: Messaging • Groupware • Databases •
Multimedia • Electronic Commerce • Security

Briefs

■ **JetForm Corp.** *of Ottawa and* **Sun Microsystems, Inc.,** *of Mountain View, Calif., last week announced they will work together to bring* **Java-based administrative workflow products** *to the marketplace. The companies want to demonstrate the enterprisewide capabilities of Java's write-once, run-anywhere promise on JetForm's automated business process forms: purchase orders, payroll, expense reports and others. JetForm expects to announce the product this fall.*

© JetForm: (613) 230-3676; Sun: (415) 960-1300

■ *Network security software maker* **Dascom, Inc.** *last week announced it has received permission from the U.S. Department of Commerce to export* **56-bit encryption** *technology to its international customers. Commerce Department export regulations require companies to seek its permission to export encryption technology with up to 56-bit keys.*

To export, companies must develop a key recovery system under which a third party holds copies of the keys. With a court order, law enforcement officials can get access to the keys and decrypt the data. Dascom, based in Santa Cruz, Calif., agreed to incorporate the key recovery mechanism into IntraVerse WebSeal and IntraVerse NetSeal, the company's enterprise network security software.

© Dascom: (408) 457-4510

■ **Technologic, Inc.** *has begun shipping its* **Interceptor Firewall Appliance** *with a Web-based interface to manage the firewall's configuration. The Interceptor, which is priced starting at $3,495, is available in English, Chinese and Japanese language versions.*

© Technologic: (800) 615-9911

Netscape's bold groupware gambit

Users and analysts say Netscape has a shot vs. industry front-runners in the e-mail market.

By Carol Sliwa

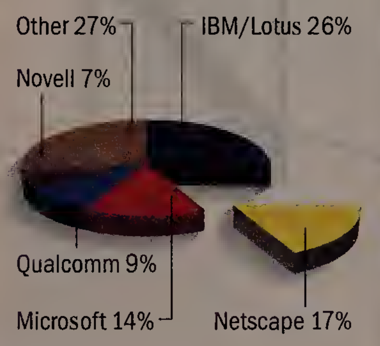
No one can accuse Netscape Communications Corp. of lacking chutzpah.

Seeking to expand its business beyond the Web browser and server markets, the Web software pioneer is going right after e-mail/groupware market leaders IBM/Lotus Development Corp., Microsoft Corp. and Novell, Inc. Netscape's weapons are its recently released Communicator groupware client and the accompanying SuiteSpot server software.

The question is, does Netscape stand a chance?

Here comes Netscape

Netscape garnered a fair chunk of new e-mail users worldwide in 1996.



SOURCE: IDC, FRAMINGHAM, MASS.

"There's a dynamic tension that forces the biggest and best companies to look over their shoulders at companies that are newer and smaller but have good ideas," said Roger Walters, chief information officer at Booz, Allen & Hamilton, Inc. of McLean, Va. "My personal feeling is that Netscape has created a niche and an identity that will probably prove a lot more resilient than people thought a year ago."

Netscape should be one of the top three groupware/messaging vendors by early 1999, said Tom Austin, a vice president with Stamford, Conn.-based Gartner Group, Inc. "But frankly, Netscape has a long way to go to get there," he said.

Netscape's challenges include battling much larger companies with big, installed bases. On the other hand, the company's adherence to IP-based standards is attractive to many customers.

Deserving of a look

Bell Canada is among the companies that think Netscape's products merit a look. The company's CIO, John Lochow, said this is particularly true for companies with roughly 20,000 to 100,000 end users.

"Lotus Notes, Exchange and Netscape Communicator and SuiteSpot — they're all equally fine products," Lochow said. "Netscape has an advantage [in that] its software is scalable for a very large implementation. The directory process is easy to manage for huge numbers of users, and the implementation doesn't require a whole lot of dedicated hardware. Therefore, it's cheaper."

With 42,000 end users, Bell Canada had many disparate mail systems it wanted to pare down to one. Lochow said he selected Netscape's server product because it was open enough to switch other vendors' messaging traffic. He also needed a product that would support Notes because Bell Canada has 12,000 workers that still plan to use the product for its groupware functionality.

If Notes got the nod as the mail system for all 42,000 end users, the cost would have been higher, Lochow said. If Exchange Server had been the choice, Bell Canada would not have been able to switch the Notes groupware traffic, and the company also would have had to use 85 servers vs. the three it plans to use for Netscape.

"We like Exchange, we've used it. But the downside is it's expensive and difficult to manage on a scale of 42,000," Lochow said. "After 17,000 users, it becomes cumbersome to administer. It's the directory synchronization [that's the problem]."

Like Bell Canada, Xilinx, Inc. of San Jose, Calif., uses a variety of mail systems. CIO Sandy Sully chose Netscape's software because she wanted to standardize on one messaging system that could provide some consistency across the company's Unix and Windows platforms.

Get more info online: NetworkWorld Fusion

- A review of three client/server e-mail packages
- An overview of a Java-based groupware system under development at the National Center for Supercomputer Applications (the Mosaic people)

www.nwfusion.com 3412

Sully said she thinks a company of Xilinx's size, with some 1,400 employees, stands to get more attention from Netscape than it would from a larger company such as Microsoft. She ruled out Lotus after finding Notes to be "an administrative nightmare" while working with her previous employer.

Booz, Allen & Hamilton was a

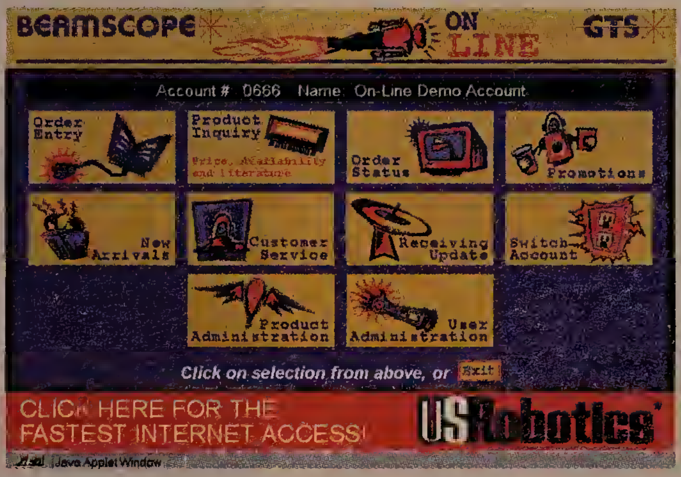
See **Mail,** *page 43*

In-Site

Doing electronic commerce the Java way

By Ellen Messmer
Toronto

As an alternative to phone orders, electronics distributor Beamscope Canada, Ltd. is now letting retail stores into its intranet to place online orders using a Java-enabled browser.



Beamscope Canada *is using an "extranet" electronic commerce application based on Java to take purchase orders from retail stores.*

For the past two months, the large Canadian distributor of video games and computer hardware has given approximately 500 stores access through its Internet firewall to view an electronic catalog of merchandise, place orders or check shipping status around the clock.

The software facilitating this is a server-based Java application from Ironside Technologies, Inc., which the company has yet to name. The application, which is running on an AS/400 server, acts as a front end to Beamscope's supply chain management system, Cantoc Business Systems, Inc.'s Censys program.

After authentication through encrypted password and ID, the online buyer gets a Java applet downloaded to his browser from the Ironside application. The Java applet gives buyers access to the Censys customer service, warehouse, inventory and order approval system. Customers then can enter their order, rather than have a Beamscope telephone representative take it. Beam-

See **Ironside,** *page 40*

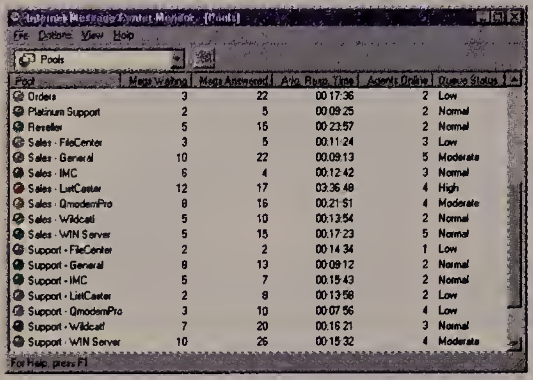
Mustang to help users corral incoming e-mail

By Paul McNamara

Bakersfield, Calif.

If you send e-mail to many corporate alias addresses — such as support@company.com or webmaster@company.com — don't hold your breath waiting for a useful response.

Mustang Software, Inc. of Bakersfield, Calif., is among a growing number of vendors addressing how to route, answer and monitor the increasing volumes of alias e-mail flowing into corporate and commercial Web sites. Mustang's Internet Message Center (IMC), client/server software that runs on top of existing e-mail systems, recently entered public beta.



Internet Message Center Monitor - [Pools]

Pool	Msgs Waiting	Msgs Answered	Avg. Resp. Time	Agents Online	Queue Status
Orders	3	22	00:17:36	2	Low
Platinum Support	2	5	00:09:25	2	Normal
Reseller	5	15	00:23:57	2	Normal
Sales - FileCenter	3	5	00:11:24	3	Low
Sales - General	10	22	00:09:13	5	Moderate
Sales - IMC	6	4	00:12:42	3	Normal
Sales - ListCaster	12	17	03:36:48	4	High
Sales - QmodemPro	8	16	00:21:51	4	Moderate
Sales - Wildcat!	5	10	00:13:54	2	Normal
Sales - WIN Server	5	15	00:17:23	5	Normal
Support - FileCenter	2	2	00:14:34	1	Low
Support - General	8	13	00:09:12	2	Normal
Support - IMC	5	7	00:15:43	2	Normal
Support - ListCaster	2	8	00:13:58	2	Low
Support - QmodemPro	3	10	00:07:56	4	Low
Support - Wildcat!	7	20	00:16:21	3	Normal
Support - WIN Server	10	26	00:15:32	4	Moderate

For Help, press F1

Mustang's IMC *enables managers to monitor the efficiency of workers responding to e-mail sent to a company's Web site alias address.*

Analysts and customers predict IMC will prove a welcome addition in shops struggling to handle large volumes of Internet e-mail.

IMC Server assigns each incoming message a tracking number, issues an immediate acknowledgment of receipt to the sender and funnels the messages into predefined Open Database Connectivity-compliant databases. Employees with IMC Agent software on their workstations request the messages one at a time, write responses and send the responses back through IMC Server and the company's e-mail system.

IMC Server creates detailed reports that allow managers to identify e-mail bottlenecks, track reply times and monitor the overall efficiency of the employees who do the answering.

IMC's server component runs on Microsoft Corp.'s NT Server 3.51 or higher and Windows 95, and requires a Simple Mail Transfer Protocol/Post Office Protocol 3 (POP3) mail server. The client software, IMC Agent, which runs on NT and Windows 95, requires a POP3 mail client such as Microsoft Outlook or Netscape Communications Corp. Mail.

"It looks like a great tool for companies [that need] to respond to their customers and prospective customers as well as monitor how well the company is responding to those people," said Mark Levitt, an analyst at International Data Group in Framingham, Mass.

Dell Computer Corp., based in Round Rock, Texas, is one such company.

"You do more than $3 million worth of sales a day over the 'Net, and it tends to generate a lot of messages," said Kerry Harrison, an Internet development specialist at Dell. "A lot" in this case means up to 20,000 e-mails per day that are not addressed to a specific person.

IMC is "an impressive set of technologies," Harrison said, adding that the report functions "would be very valuable."

Among the other companies tackling the alias e-mail challenge are Brightware, Inc., of Novato, Calif.; Kana.com of Palo Alto, Calif.; Aptex Software, Inc. of San Diego; ErgoTech Technologies, Inc. of New York; Information Cybernetics, Inc., of Cambridge, Mass.; and Forte Software, Inc., of Oakland, Calif.

Expected to ship Sept. 1, IMC will cost $1,500 per server.

© Mustang: (805) 873-2500

SIEMENS

Before you buy another phone, check

IBM is not just playing games with Java

Inverse technology is being tested with game companies, but could wind up in Lotus' product line.

By Rebecca Sykes
Boston

IBM last week demonstrated Java-based server technology designed to facilitate real-time sharing of objects on the World Wide Web.

Dubbed Inverse, the technology is designed to let end users interact over the Web without the gaps and pauses associated with today's asynchronous Web environment, according to Steve Mills, general manager of IBM's Software Solutions division, during a keynote here at Internet Expo/IBM TechCon.

IBM's Steve Mills *said the company's Inverse technology really shows off what the Web can do.*

"This takes us to a whole other level of interaction on the Web, and it's all based on Java," Mills said of the technology.

IBM is working with partners in the education and games industries to test Inverse.

"Clearly, we're not in the game business, but we're looking for strategic partners to develop the technology," said Gennaro Cuomo, manager of advanced Internet technology at IBM Software Solutions.

IBM is working with author Tom Clancy's Red Storm Entertainment company on a game called Politika, whose players must use diplomatic and strategic skills to assert control after Russia is taken over by multiple factions following the death of President Boris Yeltsin.

Using Inverse, players can see their opponents' moves in real time, Cuomo said.

Moreover, if the player who initiated the game — and, therefore, the player whose server is orchestrating it — drops out, Inverse lets one of the other players' servers take over. This eliminates the need to boot all players off and shut down the game, as it happens now, Cuomo said.

Inverse also lets users link up and go to the same places on the Web simultaneously.

For example, after an authentication procedure involving both users, the users then can link URL objects so that whatever series of Web sites one goes to, the other automatically follows, Cuomo said.

IBM also is working to ensure that Inverse integrates the linking of users with significantly different technological profiles.

For instance, someone using a 486-based PC with a 28.8K bit/sec modem could follow the Web course of a friend with a T-1 connection, Cuomo said.

Inverse works with Netscape Communications Corp.'s Navigator or Microsoft Corp.'s Internet Explorer and functions if linked people are not using the same browser, Cuomo said.

IBM would not reveal specific product plans for the technology, but Cuomo indicated that a joint announcement with its Lotus Development Corp. subsidiary might occur by year-end.

"If anything's going to happen, it's going to happen from the Lotus side of the fence," Cuomo said.

Sykes is a correspondent with IDG News Service' Boston bureau.

the expiration date.

Introducing the Optiset E family. The world's most efficient phones.

Most of today's advanced technology will be outdated tomorrow. So how do you provide tools that grow and change with the times? You stay flexible.

At Siemens, flexibility runs in the family: The high performance Optiset E digital phone family. Five separate models and nine different snap-in modules meet your every need, including the lowest cost entry level digital phone. Your number one need – ease of use – is made possible by OptiGuide, a highly intuitive interface allowing users to master advanced features.

Our exclusive modular approach lets you go from basic voice to advanced data and video communications and beyond — adopting new technologies as you need them.

The Optiset E family can do almost anything, because it does one thing exceptionally well: Evolve. Do a little evolving of your own, stop by **www.siemenscom.com/optiset.** Or call **1-800-765-6123 ext. A17.**

The Future Is Coming To Us.

Circle Reader Service #27

OFTEN, NOTHING COSTS YOU MORE THAN A SERVER CRASH.

Protect ME!
with APC

NOW SUPERIOR SERVER PROTECTION COSTS YOU NEXT TO NOTHING.

NOW AWARD-WINNING APC® PROTECTION COMES STANDARD WITH THESE SYSTEMS.

WORKGROUP SERVER

DELL® POWEREDGE® 2200 SERVER
266MHz PENTIUM® II PROCESSOR
(Expandable to Dual Processor)

- 96MB ECC Memory (512MB Max.)
- 512KB Dedicated L2 Cache
- Integrated PCI Ultra/Wide SCSI-3 Controller
- 9GB Ultra/Wide SCSI-3 Hard Drive
- 8X SCSI CD-ROM Drive
- Intel® Pro/100B PCI Ethernet Adapter
- Intel LANDesk® Server Manager v2.52
- 4/8GB Variable SCSI DAT Tape Backup Unit
- 6 Drive Bays: 3 Hard Drive, 3 External Media

★ ***Smart-UPS® 700 from APC***
★ ***Free PowerChute® Plus Software***
★ ***Optional SmartSlot™ Power Management Accessories***

- 3Com® OfficeConnect Hub 8-port/TPC
- 3 Year Limited Warranty[†] with 1 Year of NBD On-site[Δ] Service
- 7x24 Dedicated Server Hardware Technical Telephone Support

$6059

Business Lease[◊]: $211/Mo.
Order Code: 200272

DEPARTMENTAL SERVER

DELL POWEREDGE 4200 SERVER
2x266MHz PENTIUM II PROCESSORS
(Expandable to Dual Processor)

- 128MB EDO ECC Memory (1GB Max.)
- 512KB Dedicated L2 Cache per processor
- 2 Integrated Ultra SCSI-3 Controllers: 1 Ultra/Wide, 1 Ultra/Narrow
- 3x4GB Ultra/Wide SCSI-3 Hard Drive
- 8X SCSI CD-ROM Drive
- Intel Pro/100B PCI Ethernet Adapter
- Intel LANDesk Server Manager v2.52
- Redundant Hot-Swap Power Supplies
- PowerEdge Expandable RAID Controller

★ ***Smart-UPS 1400 from APC***
★ ***Free PowerChute Plus Software***
★ ***Optional SmartSlot Power Management Accessories***

- 3 Year Limited Warranty[†] with 1 Year of NBD On-site[Δ] Service
- 1 Year DirectLine℠ NOS Support
- 7x24 Dedicated Server Hardware Technical Telephone Support

$11,269

Business Lease: $382/Mo.
Order Code: 200275

ENTERPRISE SERVER

DELL POWEREDGE 6100 SERVER
2x200MHz PENTIUM PRO PROCESSORS
(Expandable to Quad Processor)

- 256MB ECC Memory (4GB Max.)
- 512KB Integrated L2 Cache per Processor
- 2 Integrated PCI Ultra/Wide SCSI-3 Controllers
- 3x9GB Ultra/Wide SCSI-3 Hard Drives
- 8X SCSI CD-ROM Drive
- Intel Pro/100B PCI Ethernet Adapter
- Redundant Hot-Swap Power Supplies
- PowerEdge Expandable RAID Controller

★ ***Smart-UPS 1400 from APC***
★ ***Free PowerChute Plus Software***
★ ***Optional SmartSlot Power Management Accessories***

- 3 Years of NBD On-site[Δ] Service
- 1 Year DirectLine NOS Support
- 7x24 Dedicated Server Hardware Technical Telephone Support

$19,569

Business Lease: $645/Mo.
Order Code: 200276

Given everything that's riding on your company's servers, crash protection is something you can't afford to be without. Which is why every Dell PowerEdge Server comes with the industry-standard features you've come to expect. And since 45%[‡‡] of all data loss is a result of bad power, we've just done something to bolster our award-winning reliability. We have worked with APC, the industry leader in power protection with over 8 million satisfied customers and a host of awards. Which means you'll find APC protection available across the entire line of PowerEdge servers, along with a $25,000 Lifetime Equipment Protection guarantee* to replace or repair your server should a power-related problem arise. So choose your Dell PowerEdge. For high-end reliability there's the Dell PowerEdge 6100, loaded with redundant cooling fans, ECC memory, hot-pluggable drives and the Smart-UPS 1400 with optional SmartSlot Power Management accessories. Or choose the Dell PowerEdge 4200, which also comes with APC Smart-UPS 1400. Or the Dell PowerEdge 2200, where only the price is entry level. Whichever you choose, two features remain consistent: reliability and value. Things no business can afford to overlook.

APC®
www.apcc.com

DELL®
800-388-2785
www.dell.com
Mon-Fri 7am-9pm CT • Sat 10am-6pm CT • Sun 12pm-5pm CT
In Canada,* call 800-839-0148
In Latin America,* call 512-728-4685
GSA Contract #GS-35F-4076D

Keycode #29050

[†] For a complete copy of our Guarantees or Limited Warranties, please write Dell USA L.P., One Dell Way, Round Rock, TX 78682. Attn: Warranty. *See APC policy for details. [‡‡] 1993 Contingency Planning Research. [◊] Leasing arranged by third-party leasing companies to qualified customers. [Δ] On-site service provided by an independent third-party provider. May not be available in certain remote areas. ★Prices and specifications valid in the U.S. only and subject to change without notice. APC, the APC logo, Smart-UPS, PowerChute and Protect ME! logo are registered trademarks, and Protect ME! and SmartSlot are trademarks of American Power Conversion, Inc. Intel and Pentium and LANDesk are registered trademarks of Intel Corporation. ©1997 Dell Computer Corporation. All rights reserved.

Circle Reader Service ***#30***

Insurance firm benefits from Web site

By Denise Pappalardo

Norwood, Mass.

New York Life Benefit Services, Inc. expects to save up to half a million dollars annually over the next five years from its new Web-based customer service system.

Giving customers direct access to information on a Web server will enable the retirement services arm of New York Life to save money by reducing the headcount of its call center staff, which is now charged with handling most customer inquiries. The benefits group also will issue fewer printed reports by allowing customers using the Client Access Web application to draft custom reports based on information in their accounts.

New York Life Benefit Services based here developed Web server applications in-house that let its 401(k) clients and the human resources groups at those client companies access their accounts using a standard Internet connection and Web browser. Most of the company's 200,000 401(k) clients currently access their individual accounts via a voice response system.

A Web site is born

The idea for the Web project was born in 1993, when the company realized that the 'Net would most likely be the best way to offer an interactive, visual application to its 401 (k) customers, said Tod Bryant, director of information systems. The company redesigned its internal record-keeping system and built the Web-based customer account system on top of that, he said.

"Cost was one issue, but staying competitive was a bigger issue."

Tod Bryant, IS, New York Life Benefit Services, referring to the company's Web site.

SHAWN G. HENRY

The company has rolled out the Web-based application to about 30,000 clients and expects that number to increase dramatically by year-end, said Dave Vangel, executive vice president at New York Life Benefits Services.

The Web system is anchored by a central Microsoft Corp. FoxPro database that stores all of the company's client account information. The company's call center staff uses that same database to fetch client information.

The actual Web server — Netscape Communications Corp.'s Enterprise Server running on a Compaq Computer Corp. ProLiant machine — sits behind a Raptor Systems, Inc. firewall at the benefits company. Because of security concerns and other reasons, the New York Life unit decided not to hand over Web server hosting responsibilities to UUNET Technologies, the Internet service provider that delivers the company's dedicated T-1 access line to the 'Net.

Customers using the benefit firm's Client Access program are encouraged to work with one of the newer browser editions, such as Netscape's Navigator 3.01 or Microsoft Corp.'s Internet Explorer 3.02. These browsers support Secure Sockets Layer encryption as well as Java, Bryant said.

Participants accessing the Web site enter an ID and password using VeriSign, Inc. authentication software. Once the end user has been approved, the session is encrypted between the end user's browser and the Web server, Bryant said. The cus-

See NYL *page 43*

Ironside

Continued from page 35

scope hopes this will reduce transaction costs associated with telephone-based orders.

"The customer can look at the catalog and place orders without having to use our telemarketing department," said Jim Jameson, Beamscope Canada's executive vice president and chief operating officer. "Censys does the credit check and the order confirmation."

In the two months since Beamscope has put the new system in place, customers appear to be placing bigger orders via the Java applet than they did through telephone representatives, Jameson said. "It may be they feel they are getting more product information, such as info on special promotions," he said.

The customers making use of the Ironside electronic commerce application in this initial rollout are "the small mom and pop stores," Jameson said. This is because Beamscope's larger trading partners already use another electronic commerce technology called Electronic Data Interchange.

"A lot of the big guys, like Wal-Mart, Business Depot and Canadian Tire, have been using EDI," Jameson noted. "But these companies are looking at our system and asking themselves, 'Why the heck are we doing EDI? EDI is not interactive.' "

EDI provides a standard format for exchanging purchase orders and freight information, but the EDI value-added networks are proprietary, making it costly and difficult to support multiple connections with different trading partners. "It costs me thousands upon thousands of dollars to catch all these transactions," Jameson said.

However, with millions of dollars invested in EDI networks integrated with back-end business systems, it's unlikely large trading partners will abandon EDI overnight.

The advent of Java-based electronic commerce over the 'Net has the potential to radically alter the balance of power in the traditional distribution chain, because it makes it easier than ever for the supplier to sell directly to the consumer.

"If we wanted, we could break our relations with the distributors and go directly to the public, but we're choosing to be the virtual warehouse instead," Jameson said. "Right now, it's not our intent to compete with our resellers." The Ironside Java application works with Censys and other enterprise business systems, such as those from SAP AG, said Bill Lipsin, Ironside Technologies' president and CEO.

The current version of the Ironside Java application is based on the Java Development Kit (JDK) 1.02 specification. The company expects to come out with a JDK 1.1 version in February. ■

Microsoft seeks control of the streaming multimedia market

By Chris Nerney

Microsoft Corp. in recent weeks has made several moves to consolidate the burgeoning streaming multimedia market around its own proposed technology standards and its NetShow streaming media server.

Streaming media technology allows end users to hear or view information as it arrives, rather than wait for an entire file to download.

In trying to make its Active Streaming Format (ASF) specification an industry standard, Microsoft is employing a strategy it has used with great success.

"What Microsoft is doing is strikingly similar to what they did with CDF [Channel Definition Format] for push technology," said Ron Rappaport, an analyst with Zona Research, Inc., of Redwood City, Calif. "They define a standard in an immature niche, wait for the industry to catch on and ride the momentum all the way home."

Microsoft quickly persuaded major push vendors such as PointCast, Inc. and BackWeb Technologies, Inc. to sign on to CDF, which has been submitted to the World Wide Web Consortium as a standard.

Last week, Microsoft debuted NetShow 2.0 (see graphic below), corralling endorsements for the streaming media server and the ASF from more than two dozen industry vendors.

The product release was made in conjunction with two related announcements by Microsoft: the purchase of streaming media vendor VXtreme, Inc. of Sunnyvale, Calif., for an undisclosed sum, and new agreements with Internet video products vendor VDOnet Corp., of Cambridge, Mass. The agreements with VDO net are intended to extend collaboration between the two companies in the streaming video and videoconferencing markets. Microsoft bought a share in VDOnet last October.

These maneuvers come close on the heels of Microsoft's July 21 deal with streaming multimedia start-up Progressive Networks, Inc. — best known for its RealAudio and RealVideo players — in which Microsoft bought a 10% stake in the company.

The cease-fire between Microsoft and Progressive, which had been battling for control of the streaming media market, should benefit users, according to Gartner Group, Inc. analyst Al Lill. "Product development should now accelerate, with ASF being the dominant platform," Lill wrote in a research paper.

Further, Lill wrote, the bundling of RealAudio and RealVideo players with Microsoft's Internet Explorer 4.0 "eliminates a major hassle."

But other high-tech giants are not ready to cede the Internet-based streaming media market to Microsoft. Oracle Corp. last week said it would propose a standard for connecting video encoders and servers to deliver real-time video broadcasts. ■

QUICK TAKE: NetShow 2.0

It's NetShow time for Microsoft

Microsoft Corp. has positioned its recently released NetShow 2.0 streaming media server as a pivotal product for delivering live multimedia content across the Internet and corporate intranets.

NetShow 2.0, a Windows NT-based service that taps into Microsoft's Internet Information Server, improves upon the previous version to deliver live multimedia content over the Internet. NetShow 1.0 enabled only on-demand audio and video streaming and multicasting via corporate networks. The new version also expands its client support beyond Windows 95 and NT 4.0 workstation to include Unix, Macintosh and Windows 3.11.

Microsoft offers NetShow 2.0 as a free add-on service to its NT-based site deployment and management product. The software also will be available free via the World Wide Web through the end of the year.

Microsoft: (800) 936-5200

Sooner or later, you'll want to get this application →

IBM

Solutions for a small planet™

← working with that application.

IBM's MQSeries™ is how
different systems do business.
It integrates apps across over 20 platforms,
from Windows NT to S/390®, without tons
of connectivity code. And without the usual back-ups
and breakdowns. For a preview CD
and rebate news, call 1 800 627-2931, code 6C7AA034
or visit www.software.ibm.com/mqseries.

IBM and S/390 are registered trademarks and Solutions for a small planet and MQSeries are trademarks of International Business Machines Corporation.
Microsoft is a registered trademark and Windows NT is a trademark of Microsoft Corporation. ©1997 IBM Corp. All rights reserved.

Capitalizing on Internet Technologies

August

INTRANet

ACCESS

A systematic approach to intranet security

DENIED

ALSO INSIDE • Chief knowledge officers and their Webs • Review: OpenConnect's OC://WebConnect • Handbook: MIME

A Network World Monthly Pullout Supplement

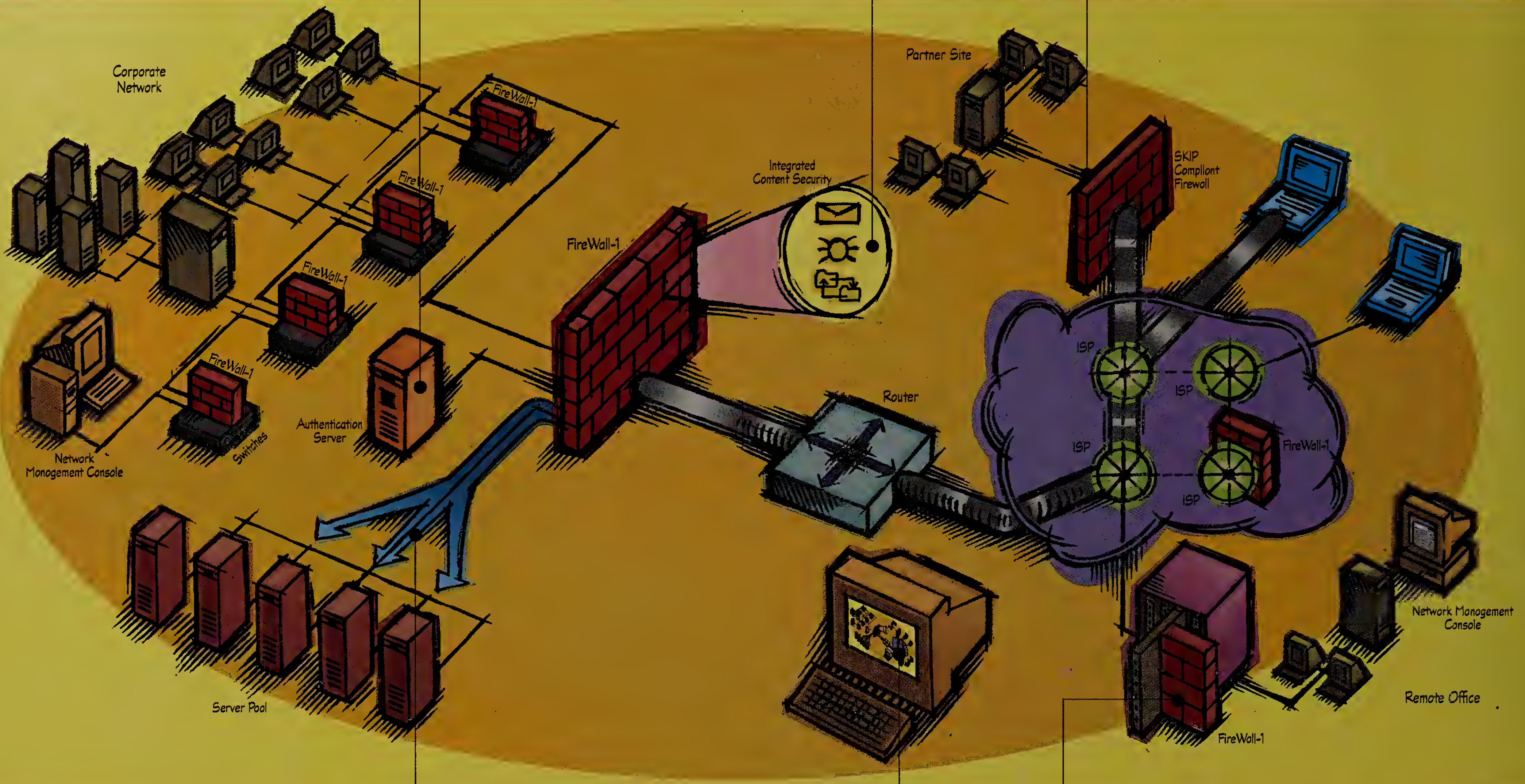
Enterprise Security.

Your requirements are real. So is our solution.

[Support for multiple authentication schemes, including RADIUS]

[Content security against macro viruses, malicious Java/ActiveX applets and undesireable URLs]

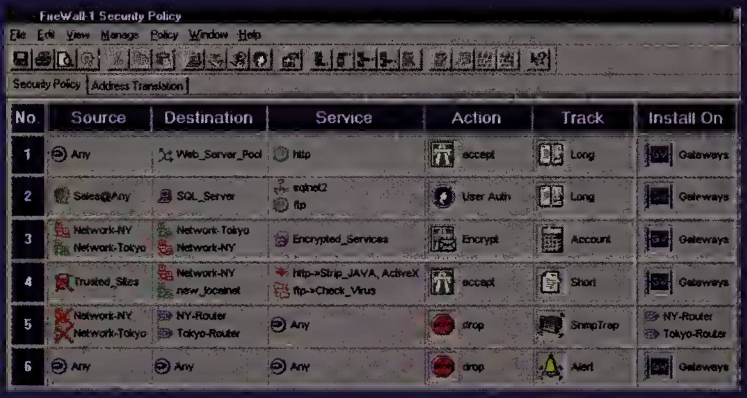
[Secure VPNs supporting emerging encryption standards for multi-vendor interoperability]



[Server load balancing for improved response time]

[Enterprise policy definition and management from central point of control]

[Ability to distribute security policy to multiple enforcement points on diverse platforms]



FireWall-1 Security Policy
File Edit View Manage Policy Window Help
Security Policy
Address Translation

No.	Source	Destination	Service	Action	Track	Install On
1	Any	Web_Server_Pool	http	accept	Long	Gateways
2	Sales@Any	SQL_Server	sqlnet2 ftp	User Auth	Long	Gateways
3	Network-NY Network-Tokyo	Network-Tokyo Network-NY	Encrypted_Services	Encrypt	Account	Gateways
4	Trusted_Sites	Network-NY new_localnet	http->Strip_JAVA, ActiveX ftp->Check_Virus	accept	Short	Gateways
5	Network-NY Network-Tokyo	NY-Router Tokyo-Router	Any	drop	SnmpTrap	NY-Router Tokyo-Router
6	Any	Any	Any	drop	Alert	Gateways

With FireWall-1, you can define a single, enterprise-wide security policy that integrates multiple applications, is distributed to multiple enforcement points and is centrally managed.

Presenting Check Point FireWall-1, the only true enterprise security solution available today. Right now. When you need it most.

You're demanding more from your network every day. To keep pace, your network security solution must reach new heights too.

Check Point FireWall-1 provides the solution. A complete application suite to meet all your enterprise security requirements. Corporate intranets and extranets. VPNs. Internet commerce. Anywhere and everywhere you want to take your network.

The entire product suite is unified by Check Point's OPSEC [Open Platform for Secure Enterprise Connectivity] policy management framework. Third-party security applications plug into OPSEC for an end-to-end solution that is centrally configured and managed.

For more information, to view seminar schedules and to register for your FREE FireWall-1 demo CD-ROM, visit our Web site at www.checkpoint.com.

CHECK POINT™
Software Technologies Ltd.

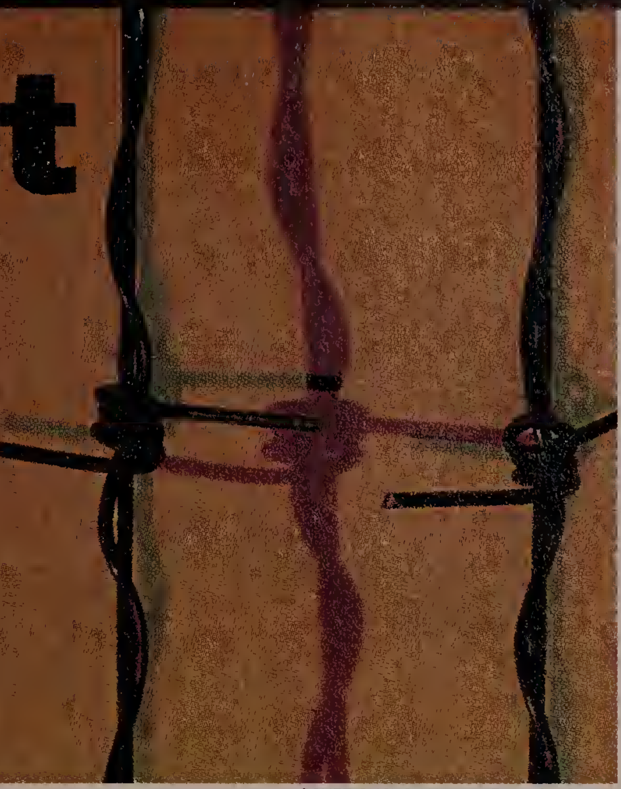
FireWall-1

©1997 Check Point Software Technologies Ltd. Check Point, the Check Point logo, FireWall-1, OPSEC and SecuRemote are trademarks of Check Point Software Technologies Ltd.

Circle Reader Service #3

IntraNet

August 1997
Volume 2, Number 8



COVER PHOTO BY PIERRE-YVES GOAVEC

FEATURES ●

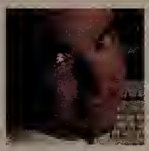
12 **COVER: Coming to grips with intranet security**
A systematic approach to intranet security might be the best defense against those hell-bent on tapping into your Web resources. Unless, of course, you'd prefer a generalized paranoia.

17

Knowing it all

There's a new executive title that's making the rounds, thanks in part to the rise of company intranets and the opening of corporate knowledge bases. Read here how these new execs — chief knowledge officers by name — define their roles and the impact they hope to have within their companies.

19



Cubic creativity

IT managers at defense contractor Cubic Corp. are finding creative ways to offer technical support services on the corporate Web. Their ingenuity, they hope, will encourage other departments to follow suit.

23

Where learning counts

General Electric Co. has the smarts it takes to spread expertise across a $79 billion business and the wherewithal to make learning a top priority. In this Q&A, Chief Learning Officer Steve Kerr tells how he encourages knowledge-sharing practices that often draw on internal Web resources.

DEPARTMENTS ●

Hot Links 5

Your virtual connection to newsbits, opinion, insight, humor and other marginalia from planet intranet.

IntraNet Handbook: MIME 6

Multi-purpose Internet Mail Extensions has developed into a primary Internet e-mail standard and critical Web technology. Here's everything you need to know about MIME.

Ask Dr. IntraNet 6

The doctor's in and giving advice on tying Netscape logons to a remote access server and on blocking access to Internet sites.

Review: WebConnect Pro 8

OpenConnect packs a lot of power in this legacy integration package, making it easy to allow links from the intranet to the Big Iron. But our reviewer isn't as positive about the documentation.

Product Watch: Basic browsers get a boost 10

Third-party software developers keep the stream of add-ons, plug-ins and other browser enhancements — for Netscape's Navigator and Microsoft's Internet Explorer — flowing steady.

IntraVert: Take the Intranet Webmaster Test 26

Columnist Mark Gibbs has come up with a quick quiz for testing prowess at building and managing the corporate Web. Take a stab at it and see how you rate.

From the Editor

It must be an odd experience at times, telling people that your corporate job title is chief knowledge officer (CKO). "Ya, right," I imagine is a common reaction.

But the title, or something similar, is finding its way into corporate lexicons all over the place. One of the Big Six accounting firms can probably lay claim to originating the CKO nomenclature, but as "Knowing it all" (see page 17) points out, other businesses have been quick to follow.

Even the Navy recognizes the position these days. And General Electric Co., a corporate power broker in a number of industry segments, has designated someone to handle knowledge-gathering and knowledge-sharing responsibilities (see page 23).

So what's behind the sudden need to appoint the keeper of corporate knowledge? Well, the rise of the corporate Web has considerable influence.

Done right, intranets greatly expand the reach of a company's knowledge resources. For those companies that have been building select, group-specific knowledge bases on platforms such as Notes, the arrival of internal Webs means a host of new users can access to that information. For those companies that have not yet begun building knowledge bases, the intranet provides a simple, inexpensive launching point.

It's heartening to learn that companies are taking a serious approach to spreading knowledge throughout their ranks and encouraging to note that intranets are often the reason for doing so.

— *Beth Schultz*, executive editor
(bschultz@nwew.com)

Visit our cyberguide to online intranet resources. Select IntraNet.
NetworkWorld Fusion

IntraNet is a supplement to *Network World* published by International Data Group of Boston. *Network World*, 161 Worcester Road, Framingham, MA 01701. Phone (508) 875-6400, Fax (508) 820-3467, E-mail nwnews@nww.com.

Staff
John Gallant, Editor in Chief (jgallant@nww.com)
John Dix, Editor (jdix@nww.com)
Beth Schultz, Executive Editor (bschultz@nww.com)
Peggy Watt, Senior Editor (pwatt@nww.com)
Mark Gibbs, Editorial Adviser (mgibbs@gibbs.com)
Michele Caterina, Managing Editor
Tom Norton, Art Director
Rob Stave, *Network World* Design Director
Allyson Nickowitz, Senior Designer
Sandra Gittlen, Senior Copy Editor
Melissa Adams, Copy Editor
Lisa Kaplan Adase, Copy Editor
Network World, Inc.
Colin Ungaro, President
Evilee Thibeault, Senior VP/Publisher
Carol Lasker, Advertising Director
Rick Groves, Sales Manager, IntraNet

Contributors Paulina Borsook (loris@well.com), Joanne Cummings (76300.536@compuserve.com), Daniel Dern (ddern@world.std.com), Elisabeth Horwitt (75244.1666@compuserve.com), Paula Jacobs (pjacobs@world.std.com), Jim Sterne (jsterne@targeting.com), Paul Korzeniowski (paulkorzen@aol.com) **Advisory Board** Miley Ainsworth, *managing director of network computing development, Federal Express Corp;* Todd Carlson, *CIO, EDS Corp.;* Vinton Cerf, *senior VP of data architecture, MCI Communications Corp.;* Steve Dieringer, *group product manager, Banc One POS Services Corp.;* Paul Hoffman, director, *Internet Mail Consortium;* Vic Langford, *senior VP and general manager of the Internet/Intranet Business Unit, Novell, Inc.;* Sheldon Laube, *CTO, USWeb;* Curt Monash, Ph.D., *president, Monash Information Services;* Ullas Naik, *VP, First Albany Corp.;* Tim O'Reilly, *president, O'Reilly & Associates, Inc.;* David Sims, *technical manager for intranet, Schlumberger, Ltd.;* Peter Spellman, *Mitre Corp.;* John Swartzendruber, *information consultant, Eli Lilly and Co.;* Kurt Wedel, *senior manager of Enterprise Programs, Netscape Communications Corp.*

At last,
a free lunch.

45 days in a row.

You thought it disappeared with the 10 cent coffee. Or that it never existed in the first place. Well, Eudora® is here to tell you that you can get something for nothing. We invite you to try WorldMail™ Server—from Eudora, the ones who brought you the world's number one client email—free for 45 days.

Get It While It's Hot.

Try Eudora WorldMail Server for 45 days at no cost and no obligation.

Visit **www.eudora.com/1nwld** for your free Eudora WorldMail Server download.

The Eudora WorldMail™ Server is ideal for small- to medium-sized businesses. Built on Internet-based IMAP4 and POP3 messaging standards, Eudora WorldMail bypasses expensive, tangled gateways to securely send your messages, including attachments, wherever you want them to go. It gives you centralized desktop setup, administration, and maintenance. And it's easy to use—even for users. WorldMail Server's scalability also ensures that you'll have enhanced communication across your organization tomorrow as well as today.

But don't take our word for it. Call us at 1-800-2-EUDORA, ext. 29731; email us at eudora-sales1nwld@eudora.com; or just visit our Web site today at www.eudora.com/1nwld to download your 45-day free trial copy of Eudora WorldMail Server. There's no cost and no obligation.

Get in on the Eudora WorldMail free trial offer today. Once you get a taste of it, you'll want it to be your email server every day.

EUDORA™

© 1997 QUALCOMM Incorporated. All rights reserved. Eudora is a registered trademark and WorldMail and Eudora WorldMail are trademarks of QUALCOMM Incorporated.

QUALCOMM

Circle Reader Service #1

Your virtual connection to newsbits, opinion,

hot links

insight, humor and other marginalia from planet intranet.

Execs need a nudge on intranets

When it comes to the strategic value of the corporate Web, it seems executive management needs a wake-up call.

Most intranets are still bubbling up from the employee depths rather than streaming down from a company's upper echelon, says Ted McKie, director of business development for Digital Equipment Corp.'s Digital Worldwide Services, of Stow, Mass.

"The trend continues to be that people put in Web servers and get some things going that draw management's attention," McKie says. "Then management says, 'Let's make sure this aligns with our major objectives.'"

Companies that push the intranet from the start are a step ahead. "When intranets are driven from the top down, they almost always align with a major corporate business objective. And that's usually electronic commerce," McKie says.

> *"Here's my advice for companies: As you're putting an intranet together, make sure you understand that you eventually will be opening it to customers."*

It's impossible to predict which companies are going to quickly recognize how an intranet can influence other corporate initiatives, McKie says. The key, he says, is having a manager who realizes that the World Wide Web may be the best solution to a particular business problem.

Controlling the push

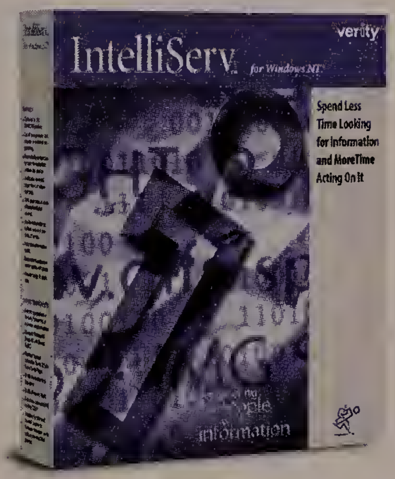
Intranet managers can keep a handle on those pushy broadcast datastreams in intranets and extranets by using new features of PacketShaper, an IP bandwidth manager, from Packeteer, Inc.

Using PacketShaper, administrators can assign priorities to IP traffic, whether it's local or coming into the intranet from the Internet. They can flag mass-broadcast content by URL or application type and assign that content to a particular bandwidth or even time of access to keep it from eating up network resources.

"I let broadcast material come through any time, but only at 28.8K bit/sec access," says Gary Regan, engineering director for Macnica USA, of San Jose, Calif.

Macnica's 650 employees need the broadcast material, but regulating it as a steady stream helps prevent bursts that tax the network and ensures the users can regularly receive their information, Regan says. "If I start to see more of certain types of traffic, I monitor it and then slow it down a bit."

PacketShaper costs $7,250, says Packeteer, of Campbell, Calif.


IntelliServ
for Windows NT
verity
Spend Less Time Looking for Information and More Time Acting On It

E&Y picks Verity

Ernst & Young LLP wants its employees in the know, and it expects Verity, Inc.'s intranet tools to get them there.

The New York firm recently announced that it has picked Verity's IntelliServ and related Search'97 products to extend its knowledge management architecture.

IntelliServ stores employee-created profiles, then uses the Search'97 technology to identify, categorize and monitor information residing on Ernst & Young's intranet. In that monitoring process, IntelliServ hits file and Web servers, databases, Lotus Development Corp. Notes and Microsoft Corp. Exchange servers. It then delivers the information it gathers via e-mail, ticker, pager or a custom Web page.

"We've learned that how you deploy content is as important as what you deploy, so we offer choices," says John Peetz, corporate chief knowledge officer at Ernst & Young.

"There's browsing, which is a pull approach because it involves perusing, and profiling, which is a push technology using IntelliServ. And there's the search technology, which is an ask-and-answer approach, using Verity," Peetz explains.

FrontPage gets artsy with 98 edition

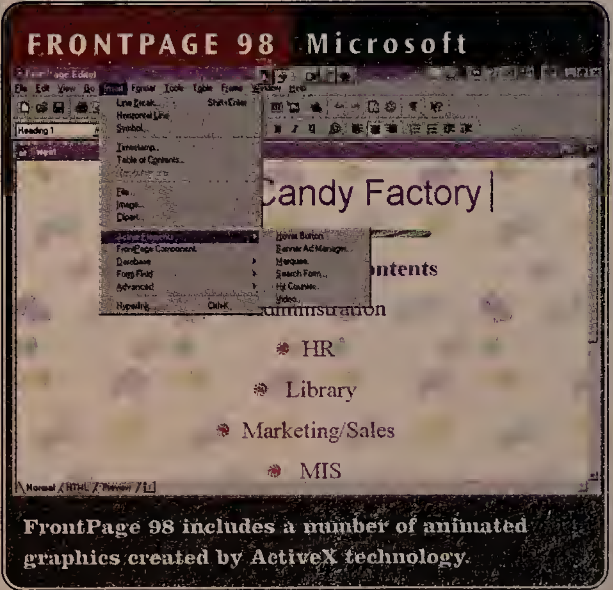
Intranet-oriented functions such as automated design tools for part-time content editors and tighter integration with Internet Explorer are featured in beta copies of Microsoft Corp.'s FrontPage 98 Web design tool, now available for free download.

Microsoft's "intelligent design assistance" includes a selection of more than 50 graphical themes — essentially templates with Java applets and ActiveX Controls — featuring animated banners and buttons, says Pat Kirtland, group product manager. FrontPage now supports Dynamic HTML, Microsoft's Common Definition Format and Cascading Style Sheets. The updated Image Composer 1.5, including a GIF animator, comes with the package.

New site management functions include an online whiteboard to design a site, multilevel views of site maps and file views that help identify duplicate graphics on a site.

Users can launch FrontPage 98 within Internet Explorer 4.0, and the Internet Information Server 4.0 Web server can automatically install FrontPage server extensions.

The FrontPage 98 beta, online now at www.microsoft.com, expires at the end of the year. It costs $149 for new users, with a $40 rebate for Office users. Upgrades cost $54.95.



FrontPage 98 includes a number of animated graphics created by ActiveX technology.

MIME: Multimedia messages for all

BY MARK GIBBS

The MIME format lets senders enclose datastreams — text, images, audio, video or application-specific data — in an e-mail message.

Those of you who saw the film "Independence Day" witnessed one of the most technically ridiculous scenes ever shown on the big screen.

Our hero whips out a laptop computer and, with virtually no trouble, establishes a wireless link to the alien spaceship's command and control system. Topping that, the systems begin exchanging data!

As outrageous as this scene is, in the real world it *is* possible to connect disparate systems and send complex data between them in an intelligible manner. For e-mail, this capability comes through the Multi-purpose Internet Mail Extensions (MIME) standard, which specifies how messages must be formatted so different mail systems can exchange them. The flexible MIME format lets senders enclose any type of datastream — text, images, audio, video or application-specific data — in an e-mail message.

Until MIME's development in the early 1990s, you couldn't send arbitrarily structured multipart content in a single message such that your intended recipient would know unambiguously each part's data type. Because MIME makes this possible, and because it offers implementation independence, it has become a primary Internet e-mail standard and a critical Web technology.

In practice

In a Simple Mail Transfer Protocol message, the header provides control information, and the body carries the content. The header contains a number of keywords, such as To:, From: and Subject:, and related values, such as mgibbs@gibbs.com, bschultz@nww.com and Final edit, respectively.

A message that contains MIME-compliant parts has two additional headers and their associated values. They are: Mime-Version: 1.0 and Content-Type: multipart/mixed; boundary=" _867238780_".

The first header declares the version of MIME in use. The second indicates the message contains multiple parts of mixed content types and identifies which string of characters — in this case _867238780_ — signals the beginning of each part. The delimiter string is chosen so it doesn't match any sequence of characters found in the contents. When used in a message, each boundary string is prefaced with a dash.

In the body of the MIME-compliant message, a declaration of the part's content type and attributes for that content follows the boundary marker string for each part. A blank line separates the MIME header from the content.

So sticking with the headers used above, a three-part message consisting of the initial text, an image and the final text would look as such:

```
— _867238780_
Content-Type: text/plain; charset="us-ascii"

Here's the screenshot.

— _867238780_
Content-Type: image/gif;
name="25974231.gif";
x-mac-type="47494666"; x-mac-creator="4A565752"
Content-Transfer-Encoding: base64
Content-Disposition: attachment; filename="25974231.gif"

R0lGODlhgALgAecAAAAAA . . .

— _867238780_
Content-Type: text/plain; charset= "us-ascii"

Mark Gibbs / Gibbs & Co. / 805.644.4999 /
www.gibbs.com
— _867238780_
```

Within a MIME-compliant message, the indication that the message type is multipart/mixed implies sequential handling of each part.

Go to the Web for more information on MIME, including:

- **The MIME Information Page**
- **A MIME FAQ**
- **HTML versions of MIME-related RFCs**
- **Newsgroups for discussing MIME issues**

www.nwfusion.com

FIND IT ON FUSION 3 4 0 1

Types and subtypes

Any part of a multipart message can have multiple parts. Six standard types describe the contents of parts that contain data. They are:

- Message. This specifies that the content is an e-mail message, of which there are three subtypes: RFC 822; partial, which indicates that the message is a fragment of a complete message; and external-body, which indicates that the content of the part is a pointer to the real content.
- Text. The two text subtypes are plain, for unstructured text, and richtext, a formatting convention that allows the definition of text attributes such as font, color and size. The "charset" parameter for text types defaults to "us-ascii" and can be set to specify any of the ISO 8859 character sets.
- Image. Subtypes are GIF or JPEG.
- Audio. The one standard subtype, basic, defines single-channel audio using 8-bit mu-law encoding at a sample rate of 8 KHz.
- Video. This has one subtype, MPEG.
- Application. This type is for the transfer of content to mail-enabled applications. The three

ASK DR. INTRANET

Please step in and lie down, Steve Blass is in for consultations. He understands the strains felt by people developing and managing intranets. Send your problems to dr.intranet@paranet.com.

How can I tie my Netscape Communications Corp. Web logons to my intranet's remote access server?

Netscape supplies a Web server API that can change the way the server authenticates user logons to restricted parts of the Web tree. Using shared libraries and dynamic run-time linking adds functionality to the Web server, too.

To change the way Netscape servers authenticate Web logons, compile a shared library containing your custom logon functions, specify the library name through the admin server interface, add AuthTrans and PathCheck directives to obj.conf, and restart the server. The user authentication procedure will use your program instead of the default .nsconfig methods.

The tough part is building the custom logon functionality in the shared library.

For example, the custom functions receive the name and password strings from the built-in basic_auth function, and forward the name and password to the authentication server for processing.

The custom function library should return REQ_PROCEED, REQ_NOACTION or REQ_ABORTED to the calling routine. This works well when basic access control is turned on, and you may gather the standard user name/password-style logons in the standard logon dialog box presented.

How can I block access to inappropriate Internet sites from my intranet?

You can monitor and restrict traffic to particular URLs at the workstations and the firewall boundaries. However, this adds cost and complexity to network operations without guaranteed compliance.

A better approach may be to implement an acceptable use policy statement that includes unique user logon IDs and passwords. If you do this, you've got to make sure users understand the consequences of breaking the rules. When they log on, they should should be flagged that use constitutes consent to monitoring.

Try to coincide the rollout of policy implementation and enforcement standards with an employee education blitz. It's a good idea to identify serious offenders from firewall and proxy logs and explain the new policy to them directly.

Blass is intranet services technology leader at Paranet, Inc., a distributed computing systems services provider based in Houston.

Many SMTP gateways to proprietary e-mail systems don't interpret MIME content correctly or won't handle large MIME attachments.

MIME CONTROL

Most e-mail products understand MIME at some level. However, they often don't handle multipart content effectively. To make life simpler for your intranet users, your e-mail packages of choice should:

- **At least give information about the data type of the part. It's important that users be able to identify executables so they can avoid accidentally running a program that contains a virus or Trojan program.**
- **Provide a way to launch an application for handling the part.**
- **Be able to save the content of parts in a file.**

subtypes are octet-stream, which defines a stream of arbitrary binary data; ODA, for documents encoded in the Open Document Interchange Format; and postscript, for PostScript data.

If an organization or application vendor wants to define new content type or subtypes, it can. It can do so by prepending "x-" to an existing content type/subtype or simply by giving the type/subtype a name that doesn't conflict with the standard ones.

One of the most important MIME headers is Content-Transfer-Encoding:. It specifies how the data is encoded for transmission as an ASCII value.

Standard encodings include 7 bit, which is the default encoding equivalent to ASCII; quoted-printable, a simple encoding suitable for data containing only a few bytes that have their eighth bit set; base64, which encodes each sequential group of three eight-bit bytes into four seven-bit bytes; and 8 bit and binary, which declare the data to be binary.

Two more common MIME headers are Content-ID: and Content-Description:. The former is semantically equivalent to the SMTP Message-ID header, and the latter allows the content to have a text description attached.

On the Web

E-mail, of course, isn't the only service that needs to handle multimedia content. And given MIME's virtuosity, it is no surprise the World Wide Web Consortium adopted MIME in HTTP, the Web's native protocol.

HTTP uses an altered form of MIME meant to optimize performance over binary connections, to allow new media types, to make date comparisons easier, and to allow for some early HTTP servers and clients that only expect text datastreams and don't understand MIME encoding.

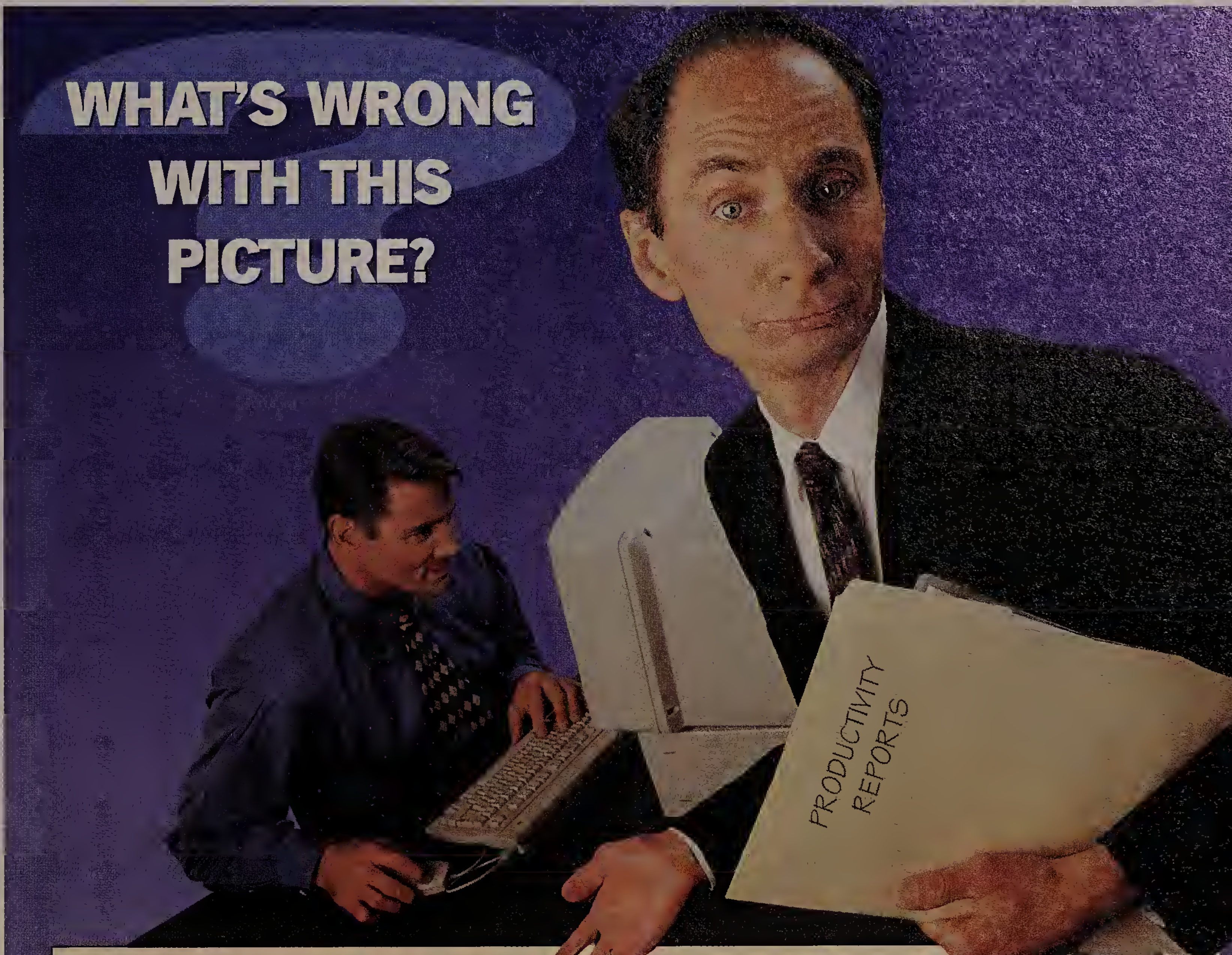
Major Web browsers and servers support MIME. Unless you're going to set up your own MIME types to define data for in-house developed plug-ins and other browser and server extensions, you'll rarely have to deal with the Web server or browser configurations.

However, if your company uses a proprietary e-mail system, be aware that many SMTP gateways don't handle MIME parts well. They either don't interpret MIME content correctly or won't handle large MIME attachments.

Now that MIME is an integral component of the Internet's core services — e-mail and the Web — security has become a real concern. To this end, the Internet Engineering Task Force has two draft standards for a secure version of MIME, or S/MIME.

S/MIME applies authentication, message integrity assurance and nonrepudiation of origin using digital signatures. S/MIME also ensures privacy and data security through encryption. However, it faces significant competition from other security mechanisms such as Pretty Good Privacy, Privacy Enhanced Mail, MIME Object Security Services and Message Security Protocol.

Whether S/MIME retains market share, its parent, MIME, is definitely part of the fabric of intranets and the Internet. And who knows, perhaps it's what the aliens use, too. ⊜



What's wrong is that it appears "Joe Worker" is hard at work. But what's really going on is frivolous surfing.

The truth is 40-60% of Internet activity is spent in unproductive sites and all this "inactivity" is costing corporations thousands of dollars in lost productivity. Employees may look busy but the reality is they're spending too much time in non-business related sites.

By allowing you to monitor and/or block access to web sites your company deems undesirable during business hours, WebSENSE actually saves money. With WebSENSE in place, you will easily enforce your Internet use policy which keeps employees productive, reduces expensive bandwidth use and protects you from potential legal action.

Don't let things go wrong in your company, install WebSENSE on your server and start saving money today!

- Professionalize Internet access
- Manage Internet resources
- Monitor employee Internet use
- Generate reports instantly

PC MAGAZINE EDITORS' CHOICE May 6, 1997 WebSENSE 3.0

"With its powerful database, detailed monitoring and friendly interface, WebSENSE is the most powerful Internet access control utility on the market."

—*PC Magazine*

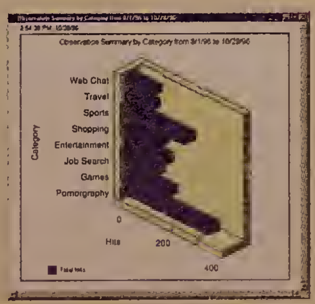
WebSENSE

The next generation in Internet filtering technology

Take our no-risk challenge, try WebSENSE FREE for 30 days. Download your copy today at www.netpart.com or call us for a CD at **800.723.1166 or 619.505.3020.**

NetPartners Internet Solutions, Inc.
9210 Sky Park Court, San Diego, California 92123
© 1997 NetPartners Internet Solutions, Inc.

Circle Reader Service #4



Actual WebSENSE report

WebConnect Pro:

Integrating intranets and Big Iron

BY MARK GIBBS

Are you looking for a way to unlock all that corporate data tied up in legacy mainframe systems? Then OpenConnect Systems, Inc. has a couple of products for you.

The first product, called OC://WebConnect, turns legacy integration into yet another service that can be accessed via that Swiss Army knife of information systems, the Web browser. Better still, a companion product, called OpenVista, makes it possible to transform the appearance and behavior of the legacy system so you can get a seamless transition between the PC and Big Iron worlds.

Companies traditionally have used terminal emulators to provide PC-based access to legacy systems. These products provide a window that emulates a 3270 or 5250 display. They connect to a mainframe through an SNA gateway.

Terminal emulators work fine, but they can be expensive to buy, deploy and maintain. That's one of the reasons the idea of using a Web browser has a lot of appeal.

One way of bringing legacy data onto an intranet is to translate the data into HTML. For this, a Web server back-end application talks to the SNA gateway and extracts the 3270 or 5250 screen data. The application then translates the data to HTML and sends it to the browser.

PROS AND CONS OpenConnect's OC://WebConnect Pro

Pros	Cons
▶ Easy to install	▶ Poor documentation
▶ Emulation works well	▶ OpenVista doesn't support VT220 sessions
▶ Strong security	

SUMMARY: OC://WebConnect is a powerful and flexible legacy integration product. Combined with OpenVista, it improves usability by allowing a PC-style interface to front-end legacy applications.

RATING

Value for money	4
Intranet usefulness	5
Quality	3
Overall	4

1 is poor and 5 is excellent.

Users enter data in a form, which the browser sends to the server application as HTML. The application translates the HTML into the host format and sends it to the mainframe.

Any browser can display and interact with the host data. On the downside, this technique does not allow for real-time updates of the client screen by the mainframe — it negatively impacts performance by requiring that the client see the complete host screen for even minor changes and, perhaps most importantly, it can compromise security.

If the client fails to terminate a session, the server may leave the mainframe connection open until the back-end application declares a time-out and terminates the session. While the session is open, the connection is vulnerable.

The use of Secure Sockets Layer or Secure HTTP removes a lot of the risk, but there are other considerations, too. The indeterminate status of sessions between requests also can tie up resources and reduce performance whenever sessions are incorrectly terminated.

OC://WebConnect gets around these problems by providing browser-based terminal-emulation services via a Java applet downloaded to each intranet client. The OC://WebConnect server is a back-end application that provides the link to the SNA gateway and the persistent applet connection. Following the Java security model, OC:// WebConnect runs on the same machine as the Web server delivering the Java applet. A Java applet is only allowed to open a connection back to the machine from which it is downloaded.

The datastream between the OC://WebConnect server and the Java applet is heavily encrypted. OpenConnect uses public-key encryption and dynamically generated keys, eliminating the need for client configuration or storage of key data.

And because all communications are done with persistent connections, the client's status is a known factor, which optimizes resource use. For example, only the changes from host screen updates need to be sent to the applet.

Testing, testing

It took me no more than five minutes to install OC://WebConnect on my intranet. The OC://WebConnect server, which is not only a broker for connections between the client applets and the SNA server but also a specialized Web server, installs as a Windows NT service. The Web server component provides a management interface through which you can set the administrator password, define sessions to hosts, monitor current session activity and start and stop the server.

I connected to the OC://WebConnect server from a remote workstation, defined a VT220 session to a modem server on my network, and then initiated a new session. It worked, making this one of the easiest and smoothest product tests I've ever attempted.

Download time is negligible because the terminal-emulation applets are only approximately 35K bytes each, and the performance impact related to having the server component mediate the connection to the host is minimal. Building links into Web pages to launch specific terminal sessions is easy. However, the paper documentation for OC: //WebConnect is poor and is not adequately supported by the far-too-brief online documentation.

Documentation drag

Worse still, the documentation and part of the product are obsolete. OpenConnect has dropped a key-based licensing system but has not taken information about it out of the documentation or removed the section in the management interface where the key is set.

The documentation for OpenVista also is weak, making it difficult to understand all of its features. Nonetheless, this product is tremendously powerful.

With this tool, you specify which fields on the host screen map to which user interface elements displayed by the client applet, and you can add behavior. For example, you might remove the need for the user to know application names and simply present a list of choices. Selecting an application name and options would send the required command line to the legacy system.

Any intranet manager with a legacy access problem will probably be willing to sacrifice a little time learning how the product works, in exchange for the potential benefits it offers.

The version I tested — 2.6 — has some indefensibly rough edges, including the poor documentation.

But OpenConnect promises to improve the documentation and add other enhancements in Version 3, which is due out in the next month or so. The company says customers with Version 2.6 will get free upgrades. ⊖

PRODUCT CAPSULE

Name:	OC://WebConnect Pro, which includes OpenVista
Current release:	Version 2.6
Price:	$595 per server plus $99 per simultaneous user
Requirements:	For OC://WebConnect server, Windows NT 3.51 with Service Pack 2 or higher, with an SNA gateway
Vendor:	OpenConnect Systems, Inc., Dallas
Contact information:	Phone: (972) 484-5200 e-mail: info@oc.com Web: www.openconnect.com

OC://WebConnect Java applets can validate and edit data, perform calculations, convert data and enhance the user interface.

An OC://WebConnect administrative tool helps determine the status of a connection, the logical unit name and model number, and IP address.

Usage Based High-Speed Internet Services

All the bandwidth you want when you want it. (And no charge for what you don't use.)

It's the bandwidth nightmare: You buy extra capacity to cover the occasional need and wind up paying for unused real estate on the line. Or you forego the investment, only to end up in the hot seat when your bandwidth falls short. UUNET® Burstable Services solve the problem. You get the full capacity of your own T-1 or T-3 connection — but pay only for actual use, based on round-the-clock sampling. It's just one of many innovations that make UUNET the world's number one Internet provider for business. Call us at **1 800 265 5612**, or visit www.uu.net/nw14, and we'll make sure you have exactly what you need.

UUNET
THE INTERNET AT WORK™

+1 703 206 5600 Web Hosting: 1 800 258 4039 VARs/Resellers: 1 888 886 3810
© 1997 UUNET Technologies, Inc., a subsidiary of WorldCom, Inc. All rights reserved. The UUNET logo is a trademark

Circle Reader Service #2

Third-party enhancements boost basic browsers

Some add-ons enable the Navigator and Internet Explorer browsers to share each other's unique technologies.

Analysts and vendors foresee tighter integration of applications — intranet- or desktop-based — with Web browsers.

BY PEGGY WATT

No doubt, Microsoft Corp. and Netscape Communications Corp. will continue evolving their browsers, but third-party developers will still have room to do their thing.

To the benefit of corporate IT shops, plenty of add-ons and plug-ins will yet appear, says Harry Fenik, an analyst with Zona Research, Inc., of Redwood City, Calif. For example, Fenik expects a good calendar program that plugs into the browser interface.

The more integrated the add-on, the better, Fenik says. "Vendors should be trying to eliminate the discrete barriers between the tools I use to HTTP, to FTP, to open files anywhere."

A key factor for the success of creative add-on software is that it support Microsoft's Internet Explorer and Netscape's Navigator, Fenik says.

Developers that support these leading Web browsers recognize the reality that many companies will be running both. Likewise, the IT department that accepts and even designates add-ons is providing its users a custom touch.

Helping browsers cooperate

One company that's clearly playing to both sides of the browser battle is Ncompass Labs, Inc., of Vancouver.

A year ago, the company introduced a Navigator plug-in, called ScriptActive, that enables Netscape's browser to run ActiveX programs. Ncompass recently took that concept further with the release of DocActive, a plug-in that lets Microsoft Office applications run inside Navigator.

Both products support Communicator, Netscape's newest browser.

GETTING MORE OUT OF NAVIGATOR

The following is a sampling of the various add-ons available for Netscape's Navigator browser.

Vendor	URL	Product	Pricing
Chilisoft	www.versicom.com/chilisoft	ChiliASP	$1,499 per server
Gradient	www.gradient.com	WebCrusader 3.0	Pricing not available
Micro Tempus	www.microtempus.com	I^{2}FM	Varies by configuration
Ncompass	www.ncompasslabs.com	ScriptActive, DocActive, ActiveEnterprise	Pricing for ScriptActive and DocActive starts at $21 and $15, respectively, and varies by volume; pricing for ActiveEnterprise had not been released as of press time
NetDynamics	www.netdynamics.com	NetDynamics Studio, NetDynamics Application Server	$1,295, $5,000 (depending on concurrent usage)

This month, Ncompass plans to begin beta testing an intranet-oriented content development and management application called ActiveEnterprise. The software provides separate tools for the IT manager and the workgroup-level Webmas-ter who updates content, and is made up of components for the server and the browser.

Content editors only see the objects to which they have access, says Lydia Loizides, Ncompass marketing coordinator. For example, one component provides menu controls for when and where on the intranet to post specified material and for when the information expires.

IT managers can use the ActiveEnterprise Server to manage content and schedule delivery of data or applications across a network. The ActiveEnterprise Administrator tools, which are accessible through the browser, let managers create templates for users and designate publishing rights. Also, a manager can change one template's design and ripple the edit across all pages that use that template, Loizides says.

ActiveEnterprise will work with Internet Explorer and support Microsoft's Channel Definition Format for Webcasting, but it also runs with Navigator and Communicator.

Another new product aimed at helping Microsoft and Netscape technology coexist is ChiliASP, from Chilisoft, Inc., of Lancaster, Pa. This tool, which runs in the background as a service, lets Netscape Web servers take advantage of Microsoft's Active Server functions.

ChiliASP essentially runs interference between non-Microsoft Web servers such as Netscape's suite, Lotus Development Corp.'s Domino and O'Reilly & Associates, Inc.'s WebSite, and objects created with Microsoft's Web development tools, says Chilisoft President Charles Crystle. ChiliASP can support pages with objects built with Microsoft's Active Server, VBScript and JScript, and can connect to any Open Database Connectivity-compliant database.

Extending to the enterprise

In contrast, the Netscape One architecture is the source of a plug-in file management tool designed for Navigator. Micro Tempus, Inc., of Montreal, is shipping Internet/Intranet File Manager, or I^{2}FM, a Java applet that provides point-and-click file management.

"You can click on a Web page or an icon and transfer data between operating systems anywhere on the network," says Stefan Lotz, systems engineer at Micro Tempus. I^{2}FM runs with Tempus Connectivity Solutions, a network management infrastructure that connects heterogeneous environments and includes development and security tools. The file management tool draws on the security functions of Tempus Connectivity Solutions and automatically provides encryption and authentication for file transfers. I^{2}FM works with Navigator 3 and Communicator.

NetDynamics, Inc., of Menlo Park, Calif., is building on the Netscape One architecture with NetDynamics Studio 3.1, a development environment and integration tool. As an application-development environment, NetDynamics Studio can integrate standard databases or whole, vertical applications, such as those from PeopleSoft, Inc. and SAP AG, and display their data in a Web format, says Sanjay Sarathy, market development manager for NetDynamics.

The process is automated via wizards and built-in formatting. NetDynamics generates SQL, HTML and Java code as needed, but can work with ActiveX, VBScript and JScript too.

The associated NetDynamics Application Server provides a distributed server architecture, supporting load balancing and multiple database connections. It works with any Web server, browser, HTML editor or Java Virtual Machine, Sarathy says.

A little more generic, but nonetheless welcome, associate for a Netscape server is the updated WebCrusader, part of a security product family from Gradient Technologies, Inc., of Marlborough, Mass. Gradient expects to ship WebCrusader 3.0 this summer, adding support for Secure Sockets Layer, the InTrust public key and Kerberos Level 5 private keys.

Upgrade Now! APC's Trade-UPS™ Plan boosts Web server power protection

Now you can easily trade in your old UPS for discounts toward enhanced APC protection. Plus, discover the myths and musts of web server protection. See how Smart-UPS® seamlessly integrates with and provides graceful shutdown for major web platforms, including Windows NT and Solaris. The bundled PowerChute plus *WebAgent™ lets users manage their UPS via web browser. Get your FREE handbook today!**

○ **Yes!** I'm interested in trading up an older APC or competitors' UPS to a Smart-UPS. Please send Trade-UPS information.

○ **No,** but I would like a FREE Handbook!

Name: ____________________
Company: ____________________
Title: ____________________
Address: ____________________
____
City: ____________ State: ______ Zip: ________
Phone: ____________ Fax: ____________
Brand of UPS used? ____________ # ________
Brand of PCs used? ____________ # ________
Brand of Servers used? ____________ # ________

* We regret we cannot fulfill incomplete requests.

"...Inherent flexibility and excellent software... Don't be caught without one."

Dept. E2-WEB

APC®

888-289-APCC x7057
http://www.apcc.com

8/18/97 NWW

©1997. APC. All rights reserved. Smart-UPS, Trade-UPS and SmartSlot are trademarks of American Power Conversion. SU02EBRC. Fax: 401-788-2797. Worldwide: (+1)401-789-0204. PowerFax Literature: 800-347-FAXX.

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST-CLASS MAIL PERMIT NO. 36 WEST KINGSTON, RI

POSTAGE WILL BE PAID BY ADDRESSEE

APC
AMERICAN POWER CONVERSION
DEPT. BRC-E2-WEB
132 FAIRGROUNDS ROAD
PO BOX 278
WEST KINGSTON RI 02892-9920

Our new Smart-UPS® ensures the web hits you *want*... and prevents those you *don't*

Web-enabled PowerChute® *plus* now ships with every Smart-UPS®

Protect ME! APC

Whether you're using the web to sell or support, once you invest in a web server and operating system, you've made a commitment to yourself, your company and your customers. However, without power protection, you risk losing your expensive software, hardware, and data, and the opportunity to interface with new prospects and existing customers. That's why the worlds most reliable power protection is now available to meet your web-based needs.

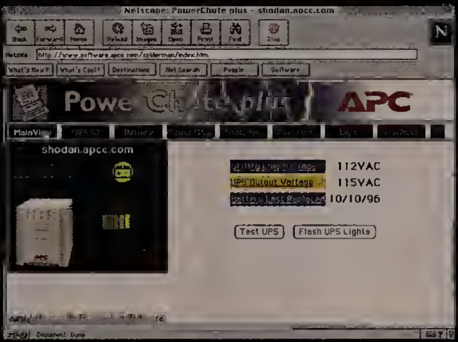
Smart-UPS® ensures your web server is always there, like you promised. Don't become a statistic! Power problems damage hardware, and are the leading cause of data-loss.

APC Smart-UPS ensures protection from surges, spikes and lost power. Backed by a $25,000 lifetime equipment protection guarantee, Smart-UPS brings the confidence of APC to the excitement and opportunity of the Web.

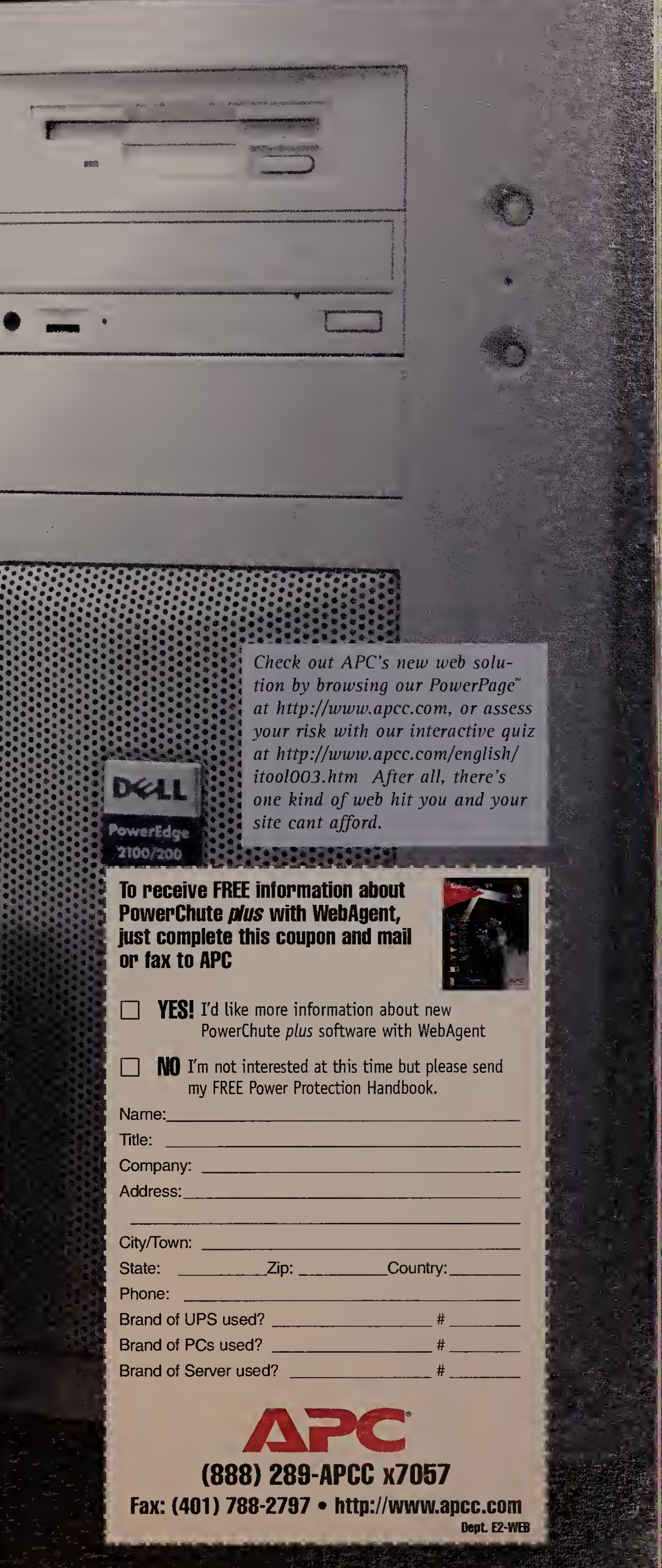
All 120V Smart-UPS now include FREE Web enabled PowerChute *plus* software for safe web server and OS shutdown. PowerChute *plus* protects system and data integrity by automatically shutting down server applications and operating systems.

PowerChute *plus*' FlexEvents™ feature can page you when an out-of-bounds environmental condition occurs. APC's NEW WebAgent™ allows administrators to manage their Smart-UPS via their browser. NEW WebAlert™ notifies users of Web server shutdown.

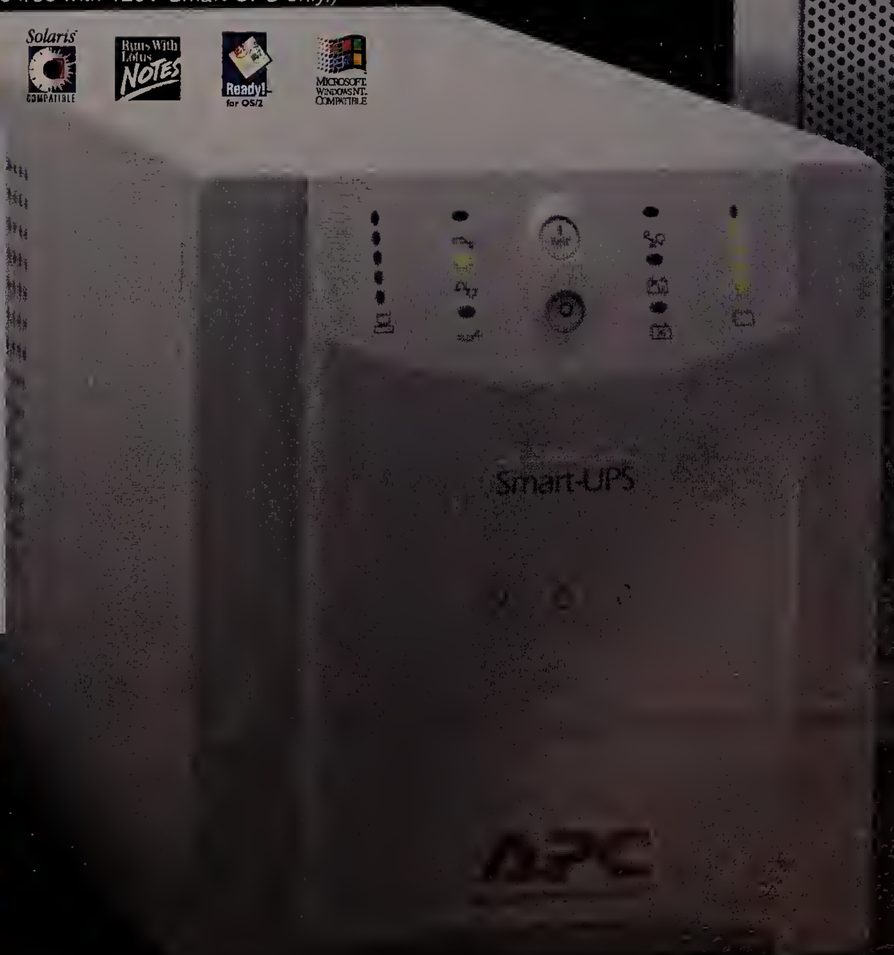
Instead of increasing your risk by waiting, join over 8,000,000 satisfied computer users worldwide who prefer APC to protect hardware and data.



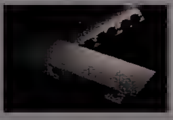
Smart-UPS now ships with PowerChute plus power management software with WebAgent, to make Smart-UPS browser-manageable. (Ships free with 120V Smart-UPS only.)



Check out APC's new web solution by browsing our PowerPage™ at http://www.apcc.com, or assess your risk with our interactive quiz at http://www.apcc.com/english/itool003.htm After all, there's one kind of web hit you and your site cant afford.



APC's award-winning Smart-UPS units are available in convenient rack-mount models. The Smart-UPS XL series is recommended for long runtime applications. For maximum protection, ask about our new NetShelter™ premium rack enclosures for all server and internetworking equipment sales.



APC's MasterSwitch™ provides Web/SNMP-manageable, independent control of power to connected loads.

"...inherent flexibility and excellent software. Don't be caught without one"

PC MAGAZINE EDITORS' CHOICE
November 19, 1996
APC Smart-UPS 1000

To receive FREE information about PowerChute *plus* with WebAgent, just complete this coupon and mail or fax to APC

☐ **YES!** I'd like more information about new PowerChute *plus* software with WebAgent

☐ **NO** I'm not interested at this time but please send my FREE Power Protection Handbook.

Name:____________________
Title: ____________________
Company: ____________________
Address:____________________
____
City/Town: ____________________
State: __________Zip: __________Country:________
Phone: ____________________
Brand of UPS used? ____________ # ______
Brand of PCs used? ____________ # ______
Brand of Server used? ____________ # ______

APC
(888) 289-APCC x7057
Fax: (401) 788-2797 • http://www.apcc.com
Dept. E2-WEB

©1997 APC. All Trademarks are the property of their owners. SU02ET • (800)347-FAXX PowerFax • CompuServe: GO APCSUPPORT • E-mail: apctech@apcc.com • 132 Fairgrounds Road, West Kingston, RI 02892 USA

APC has won more awards for reliability than all other UPS vendors combined.

Best Buy · Network Computing · LAN TIMES Readers' Choice

Circle Reader Service #5

COMING TO GRIPS with intranet security

A systematic approach to a wicked problem

BY JAMES KOBIELUS

Monty Python had a sketch in which a paranoid army commander imagining enemies on all sides orders his troops: "Surround everybody, everywhere with everything we've got."

Pondering intranet security makes you feel something like that.

The challenge seems too vast and amorphous to admit coherent solutions. Generalized paranoia may, in fact, be the correct attitude when considering how to secure the browsers, applications, databases, departmental servers, hosts, firewalls, gateways and routers on your intranet.

There are myriad places where hackers can penetrate your network to eavesdrop, steal information, plant viruses and cause general disruption. And you can never fully protect your company against information theft or misuse by insiders, who can navigate the intranet without arousing suspicion until considerable damage has been done.

We've been treated recently to a steady stream of intranet security news, the sheer frequency of which should shake even the most jaded network and systems managers out of their complacency.

Getting your arms around intranet security is no mean feat, and it's made all the more difficult by rapid changes in technologies and standards. Indeed, browser, Web site and firewall security are such embryonic concepts that intranet managers have only recently begun to approach them systematically.

What's worse, few intranet software vendors work out all the security bugs before they ship product, says Chris Hart, who manages an intranet for Eastern Kentucky University, in Richmond. "Sometimes we find [security loopholes] six to 12 months after product is released."

With luck, Hart adds, you find the vulnerabilities "before the malicious part of the general public finds them."

Hart cites a recently discovered (but now-patched) bug in Microsoft Corp.'s Internet Information Server that could have allowed an Internet user to telnet to Port 129 and lock the server's CPU on 100% utilization. "We were vulnerable for a few months to this sort of denial-of-service attack from the Internet," he says.

Most network managers initially focus on securing their intranet's perimeter, primarily by implementing firewalls on IP connections and token authentication on dial-up access lines, according to Nick Hammond, president of NJH Security, an Atlanta-based Internet security consulting firm.

Such priorities are understandable, says Hammond, given the preoccupation with hackers and Internet-borne viruses, but the painful reality is that most intranet security breaches are inside jobs.

You can deal with intranet security issues on a crisis-by-crisis basis or take a rational, proactive, systematic approach. An excellent place to start is to peruse Lincoln Stein's detailed, regularly updated "World Wide Web Security FAQ" at www.genome.wi.mit.edu /WWW/faqs/www-security-faq.html.

Looked at systematically, intranet security is no different in principle from traditional network and system security. You can group most issues into the categories of client security, server security and gateway security (an "insider-out" approach).

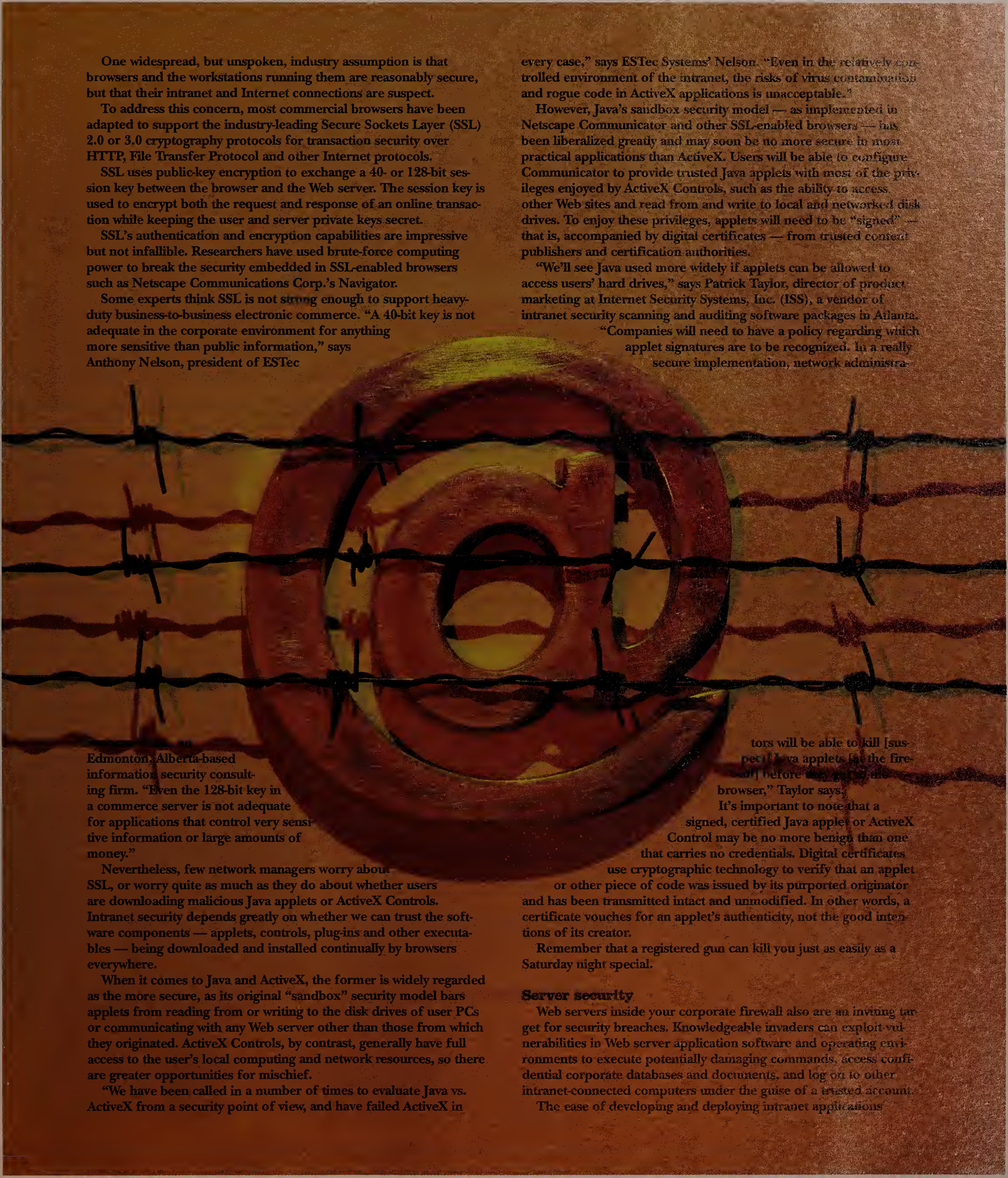
Browsers are the primary but not exclusive focus of intranet client security. It stands to reason that browsers can be no more secure than the operating systems and workstations on which they run and the users they serve.

By traditional information systems criteria, today's Web browsers are very insecure application front ends. Mass-market browsers do not have the security features needed to support sensitive, mission-critical intranet applications, Hart says.

Some of the most common vulnerabilities in today's commercial browsers include lack of password protection, inability of the browser to time-out after a period of nonusage, unlimited access to local computer resources, and disclosure of sensitive data through browser back and forward buttons, prior address-box entries, history boxes, bookmarks and highlighted links.

Sophisticated users are addressing these vulnerabilities by implementing security-aware client applications, says Brad Johnson, principal at SystemExperts Corp., a security consulting firm in Westerly, R.I.

"Many [intranet application developers] are deciding that it's OK to add requirements to the client to ensure the manageability and security of their Web transactions," Johnson says. "This includes a variety of items such as browser plug-ins, security-enabled browsers, site-specific pass codes and application-specific front ends."


PIERRE-YVES GOAVEC

One widespread, but unspoken, industry assumption is that browsers and the workstations running them are reasonably secure, but that their intranet and Internet connections are suspect.

To address this concern, most commercial browsers have been adapted to support the industry-leading Secure Sockets Layer (SSL) 2.0 or 3.0 cryptography protocols for transaction security over HTTP, File Transfer Protocol and other Internet protocols.

SSL uses public-key encryption to exchange a 40- or 128-bit session key between the browser and the Web server. The session key is used to encrypt both the request and response of an online transaction while keeping the user and server private keys secret.

SSL's authentication and encryption capabilities are impressive but not infallible. Researchers have used brute-force computing power to break the security embedded in SSL-enabled browsers such as Netscape Communications Corp.'s Navigator.

Some experts think SSL is not strong enough to support heavy-duty business-to-business electronic commerce. "A 40-bit key is not adequate in the corporate environment for anything more sensitive than public information," says Anthony Nelson, president of ESTec [illegible] Edmonton, Alberta-based information security consulting firm. "Even the 128-bit key in a commerce server is not adequate for applications that control very sensitive information or large amounts of money."

Nevertheless, few network managers worry about SSL, or worry quite as much as they do about whether users are downloading malicious Java applets or ActiveX Controls. Intranet security depends greatly on whether we can trust the software components — applets, controls, plug-ins and other executables — being downloaded and installed continually by browsers everywhere.

When it comes to Java and ActiveX, the former is widely regarded as the more secure, as its original "sandbox" security model bars applets from reading from or writing to the disk drives of user PCs or communicating with any Web server other than those from which they originated. ActiveX Controls, by contrast, generally have full access to the user's local computing and network resources, so there are greater opportunities for mischief.

"We have been called in a number of times to evaluate Java vs. ActiveX from a security point of view, and have failed ActiveX in every case," says ESTec Systems' Nelson. "Even in the relatively controlled environment of the intranet, the risks of virus contamination and rogue code in ActiveX applications is unacceptable."

However, Java's sandbox security model — as implemented in Netscape Communicator and other SSL-enabled browsers — has been liberalized greatly and may soon be no more secure in most practical applications than ActiveX. Users will be able to configure Communicator to provide trusted Java applets with most of the privileges enjoyed by ActiveX Controls, such as the ability to access other Web sites and read from and write to local and networked disk drives. To enjoy these privileges, applets will need to be "signed" — that is, accompanied by digital certificates — from trusted content publishers and certification authorities.

"We'll see Java used more widely if applets can be allowed to access users' hard drives," says Patrick Taylor, director of product marketing at Internet Security Systems, Inc. (ISS), a vendor of intranet security scanning and auditing software packages in Atlanta. "Companies will need to have a policy regarding which applet signatures are to be recognized. In a really secure implementation, network administrators will be able to kill [suspect] Java applets [at the firewall] before they get to the browser," Taylor says.

It's important to note that a signed, certified Java applet or ActiveX Control may be no more benign than one that carries no credentials. Digital certificates use cryptographic technology to verify that an applet or other piece of code was issued by its purported originator and has been transmitted intact and unmodified. In other words, a certificate vouches for an applet's authenticity, not the good intentions of its creator.

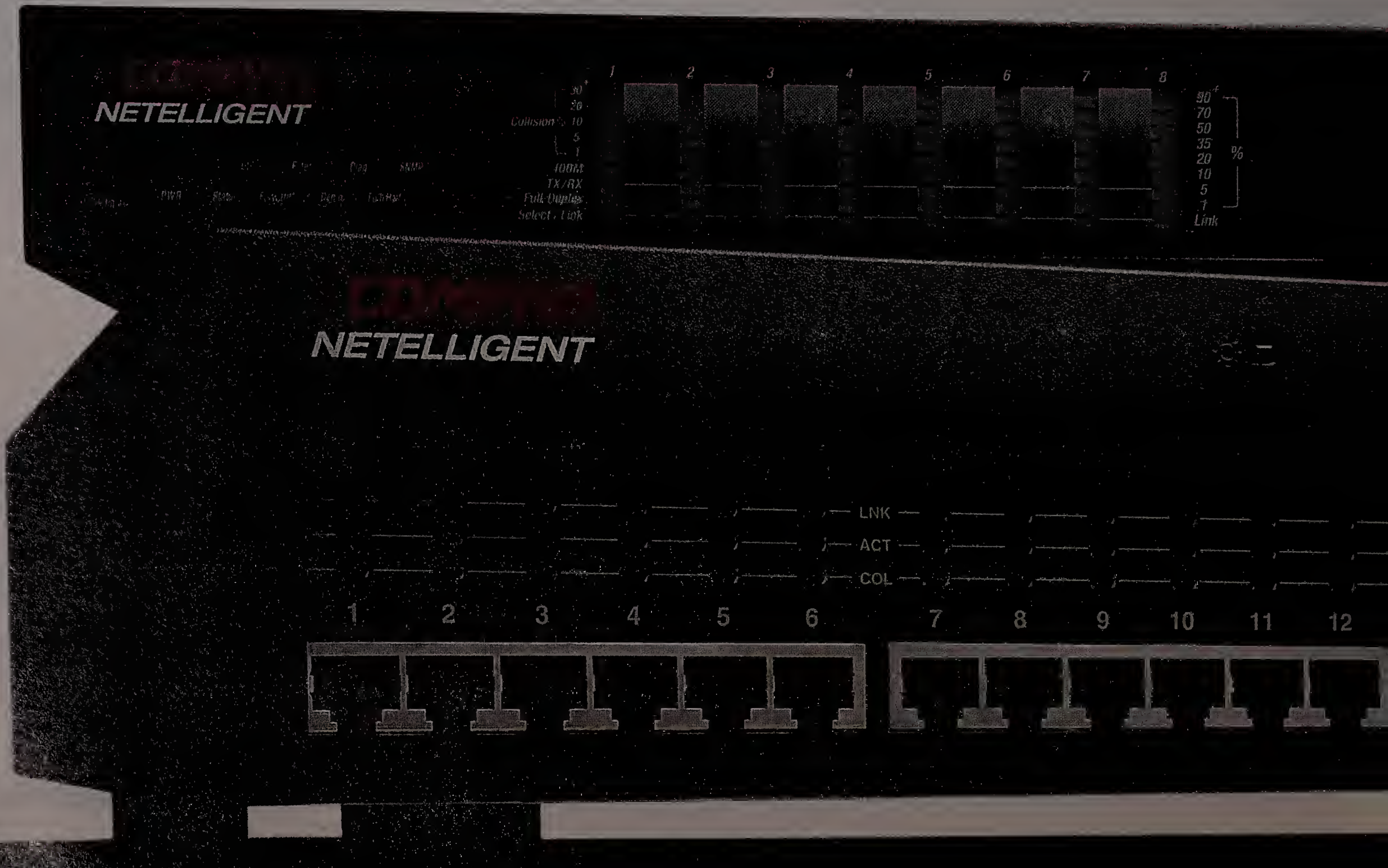
Remember that a registered gun can kill you just as easily as a Saturday night special.

Server security

Web servers inside your corporate firewall also are an inviting target for security breaches. Knowledgeable invaders can exploit vulnerabilities in Web server application software and operating environments to execute potentially damaging commands, access confidential corporate databases and documents, and log on to other intranet-connected computers under the guise of a trusted account.

The ease of developing and deploying intranet applications

In an ideal world, the company you trust
and servers would make
Welcome to an ideal world.



[illegible] Compaq Computer Corporation. All rights reserved. Compaq registered U.S. Patent and Trademark Office. Netelligent is a trademark of Compaq Computer Corporation.
All other brands and product names are trademarks or registered trademarks of their respective companies.

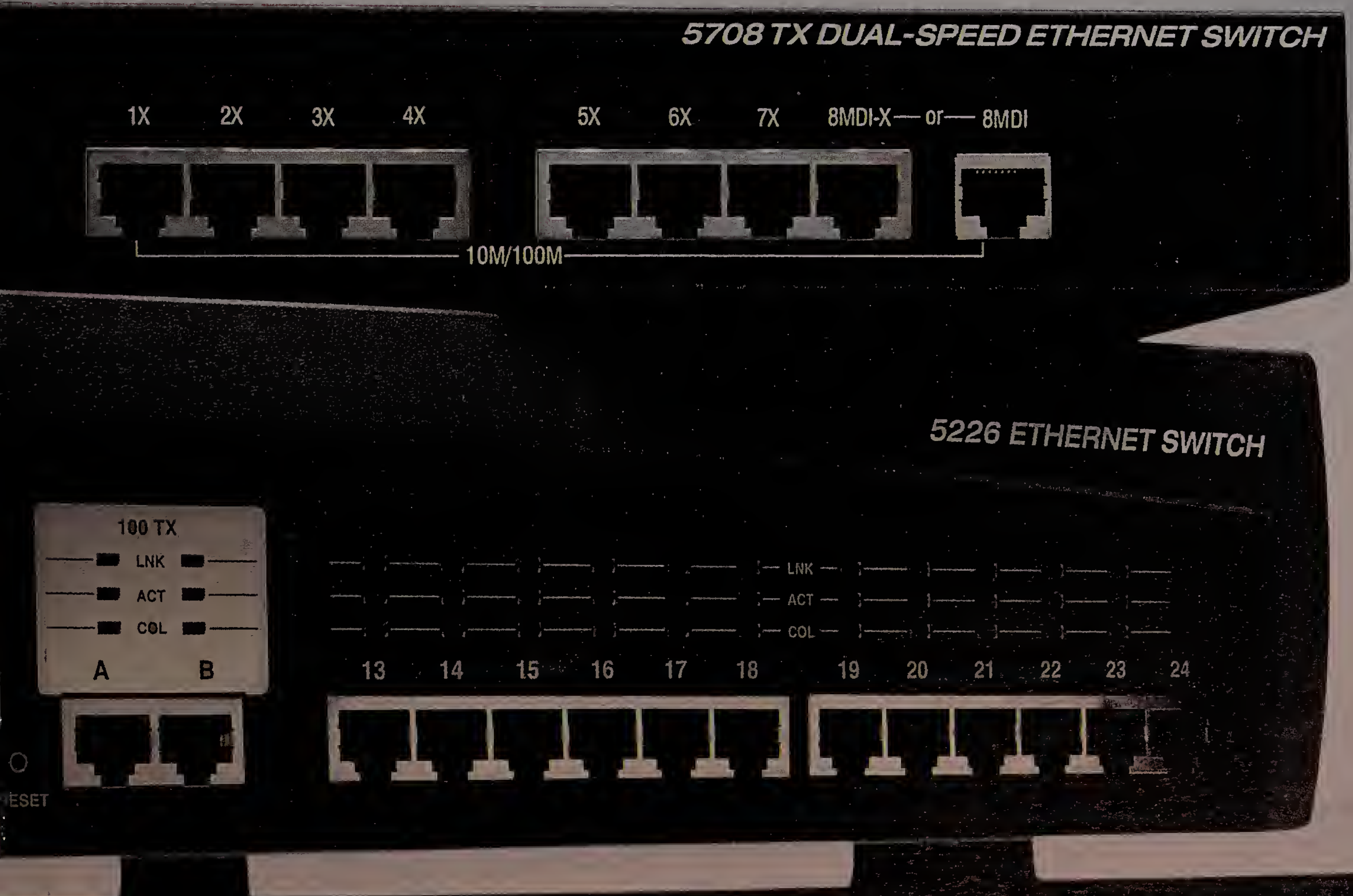
for PCs
switches too.

Wouldn't it be great to get the same quality and performance in your switches that you've come to expect from your PCs and servers? Wouldn't it be Utopia? At the very least it would be close.

Introducing the newest additions to the Compaq Netelligent Switch family that provide breakthrough bandwidth easily and affordably. Like the Netelligent 5708 Dual-Speed Ethernet Switch. Because it's autosensing, all 8 ports automatically configure to either 10 or 100MB/s at full- or half-duplex for truly flexible migration.

Then there's the Netelligent 5226 Workgroup Ethernet Switch. It lets you manage your workgroups at desktop switching prices. With 24 Ethernet and 2 Fast Ethernet ports, all with full- or half-duplex operation, you can future-proof your network, boost performance and relieve bottlenecks. And thanks to Compaq ASIC technology, it delivers fast access to your applications at wire-speed.

Additionally, our Netelligent switches with modular designs let you configure solutions to match your needs. Other innovative features include a hot-swappable, dual-redundant power supply and built-in manageability with Compaq Netelligent Management Software, SNMP, Telnet, VLAN and RMON probe support. Netelligent switches from Compaq. In a world where you don't expect anything to be ideal, isn't it refreshing to find a few things that are? For more information visit us at www.compaq.com/products/networking or call 1-800-645-6645.



COMPAQ

makes chronic security problems all but inevitable, says SystemExperts' Johnson.

"Developing Web applications is different from developing traditional IS applications," Johnson says. "It's easier to get from marketing ideas to [an HTML-based application] that's out on the 'Net without checking the security implications."

To repel attacks on servers, you will need to sniff out security loopholes in the configuration of applications and operating systems running on those machines.

"Intranet servers with sensitive information need to be regularly tested at a number of levels," says ESTec's Nelson. "From the number of fraud investigations I perform, it appears that application-level security is being neglected by a large portion of companies. Testing needs to evaluate the interface between the [HTML] front end . . . and middleware [such as relational databases and Common Gateway Interface scripts,] as well as the interface between the middleware and the operating system."

Go ahead, add security-aware client applications to shore up the safety of Web transactions, advises Brad Johnson, principal at SystemExperts.

Browsers don't have the security features needed to support sensitive applications, bemoans Chris Hart, intranet manager at Eastern Kentucky University.

KENNE

CGI scripts running on the Web server are a critical link from user-downloaded HTML pages to databases, documents and other resources residing on the corporate intranet. CGI scripts can compromise security by, for example, launching viruses, reading and writing to sensitive databases, swamping host computers with excessive traffic and transferring password files and system configuration data to unauthorized, remote third-party entities.

Security experts advise Webmasters to place all CGI scripts in a single, read-only subdirectory, to remove unused script files and to audit scripts for commands that invoke vulnerable executables such as finger, phf, test-CGI, sh, csh, Perl, Bash and Rlogin.

Many problematic CGI scripts have taken root on Web servers worldwide, and Webmasters may not be aware of their vulnerabilities or of the software patches that have been distributed to close the loopholes.

Take, for example, the vulnerability of the phf script, a white pages directory service program that was shipped with Version 1.5a and earlier releases of the National Center for Supercomputing Applications (NCSA) Unix-based Web server. The phf script allows Internet users to pass new-line characters to the Web server's Unix shell. This makes it possible for unauthorized personnel to execute arbitrary commands on the server and access password files and other sensitive information.

The problem, discovered in March 1996, was corrected in subsequent NCSA software releases. Yet, if you look in the log of almost any Web server, "you'll still find people trying to locate and access the phf CGI script because hackers know that many companies never fixed the problem," says NJH Security's Hammond.

Beleaguered intranet managers may have trouble keeping up with the variety of things that need patching on their network at any point in time, which assures a continuing supply of fresh opportunities for diligent hackers.

ISS addresses this problem with a software tool that automatically scans intranet servers for potential security problems that could be caused by the latest identified vulnerabilities. The software then automatically generates HTML-formatted security reports for network administrators.

Many security consultants advise radical simplicity when configuring general-purpose servers for intranet applications, running one basic Internet application per server and removing all services, drivers, privileges and files not absolutely essential to that particular service.

"If you have a host that is only used for Web services, you can very finely configure that system for Web-centric issues," says SystemExperts' Johnson. "If you have a host that is used for mail services, the same is true. However, when you put both mail and Web services on the same host, because they are vastly different applications with different needs, the end result is a more general administrative profile that can somehow satisfy the requirements of both service at the same time. This almost always has the effect of making things considerably less secure. The further you carry this scenario out — that is, one host running Web, mail, news, routing, etc. — the more true this becomes.

"It becomes almost unbearable when you consider the ramifications of failure," Johnson continues. "Let's say the mail service is compromised. What do you do? In reality, you now need to shut down all of the other services just because you had a mail problem."

Gateway security

However many intranet servers you deploy, you will need to keep them secure behind some combination of screening routers, application-level firewalls, proxy servers and dial-up modems, which collectively define the "gateway" into your corporate network.

You also may choose to implement these gateway security devices within your company for cases in which some business units need to shield information from others or from "extranet" trading partners to which you have opened selected portions of your corporate intranet.

Many intranet managers have chosen to install screening routers in front of application-level firewalls and proxies in order to take advantage of the complementary features of these technologies.

"We're seriously considering using hardware-based secure routers in front of our application-level firewalls from Check Point Software," says Hart of Eastern Kentucky University.

The main advantages of screening routers over application-level firewalls, he says, are performance, reliability, and ease of installation and administration.

"With hardware-based routers, you just set the device up, drop it in and let it go. With software-based firewalls, which run on general-purpose operating systems such as Unix and Windows NT, there are more features to configure. Consequently," Hart says, "there is more stuff that could potentially fail."

Nevertheless, Hart says he'll continue to rely on application-level firewalls to support more sophisticated screening and auditing.

No matter how sophisticated your firewalls, they will come to naught unless you use them to enforce well-thought-out access controls. There are varying schools of thought on the issue of firewall security policies.

Some experts say paranoia is the best policy and advise intranet administrators to block Internet access to any service or server for which there is no explicit business case for open access. Others, coming out of the open Internet environment, will only block remote access to the most sensitive servers or data on the intranet or in response to a demonstrated security breach.

One traditional weakness of firewalls has been inadequate integration with other network and computer security systems. Leading firewall vendors are addressing this by establishing open management frameworks that include APIs and scripting languages to facilitate integration with third-party tools.

Check Point Software's Open Platform for Secure Enterprise Connectivity and Cisco's Enterprise Security Architecture have similar aims, not the least of which is to enable centralized intranet security administration from the firewall vendor's administration console. Each has recruited many security vendors to their respective camps, including providers of screening router, authentication, authorization, encryption, intrusion detection, virus scanning, event analysis and reporting products.

If implemented widely by security vendors, these intranet security frameworks will make possible real-time feedback of intranet security breaches — such as unauthorized user attempts to access sensitive Web servers — to all corporate firewalls, which could then dynamically revise their access controls to lock the invader out.

The firewall also would be able to dynamically invoke the appropriate security tools — such as Java applet and virus scanners — to deal with the situation. In other words, perimeter intranet security filtering and screening rules could adapt in real time to reflect events within the intranet.

"Firewalls are an organic reality and have to be maintained [to stay effective]," says Alex Henthorn, security product manager at Livingston Enterprises, Inc., a vendor of router-based firewalls in Pleasanton, Calif. "Firewalls are meant to slow down attacks so that you can make adjustments" to control the damage, Henthorn says.

Intranet security is an evolving discipline, with network managers learning just enough about the latest threats to hopefully stay a step ahead of the wolf-pack. Remember that "they" are indeed out to get you and your network, but don't let that spook you.

A well-thought-out security plan will keep you poised to respond quickly to the inevitable new emergencies.

Kobielus is a senior telecommunications analyst at LCC International, Inc., an Arlington, Va.-based network design, engineering and integration firm.

Knowing it all

BY PEGGY WATT

In days of downsizing and ever-heightened competition, every company faces the challenge of making the most of what it has — and knows.

So emerges one of the new jobs of the '90s: chief knowledge officer (CKO), which joins the peer positions of chief technology officer (CTO), chief information officer and chief operating officer (COO) with duties that stretch across the company.

A CKO must ensure that corporate knowledge banks are open to any employee who can put them to good use for the company. Managing this information asset is not the same as overseeing technology, say those who have carved out the position, but CKOs and CIOs will do their respective jobs better if they work well together.

A CKO tries to get a handle on the company's repositories of research, resources and expertise, including where they are stored and who manages and accesses them. Then the CKO encourages pollination among disparate workgroups with complementary resources. The CKO may work with the CIO to make those materials widely available via browsers and modems.

It's probably no surprise that intranets are emerging at about the same time as CKOs because the internal Web is a key component of most corporations' knowledge management resources. It's easier to distribute and, the CKO hopes, to share information when a company has a variety of resources readily accessible from anyone's desktop anywhere.

At the Big Six

CKOs have been logging in around the country for the past three years or so. The Big Six accounting firms were among the first to develop the position and sometimes even a knowledge department.

These professional services firms, whose trade in stock is expertise and information, have been managing knowledge for some time, says John Peetz, who has been corporate CKO at Ernst & Young LLP in New York for two years. "The larger we get, the more important it is to focus our efforts."

Peetz, who chairs a team of CKOs at Ernst & Young's member organizations around the world, oversees the people who manage crucial corporate resources, including the intranet, company databases and knowledge bases, and vendor contracts for information resources. He observes that,

Information-sharing intranets spawn knowledge managers.

in part, research services are changing within consulting organizations because of the explosion of information outlets.

Instead of librarians retrieving information, Peetz explains, they may supply sources for researchers to do their own searches.

And folks in the top knowledge position can identify return on investment for their companies.

"We have a lot of metrics," Peetz says. "We have surveyed what factors went into winning a competitive assignment, for example, and checked use of knowledge resources against that success."

The role of CKO at Coopers & Lybrand LLP emerged as the company began building its intranet in 1996. The goal in creating the position was to keep the organization from focusing too much on technological toys to the detriment of content, says Ellen Knapp, a vice chairman of the firm and its first CKO.

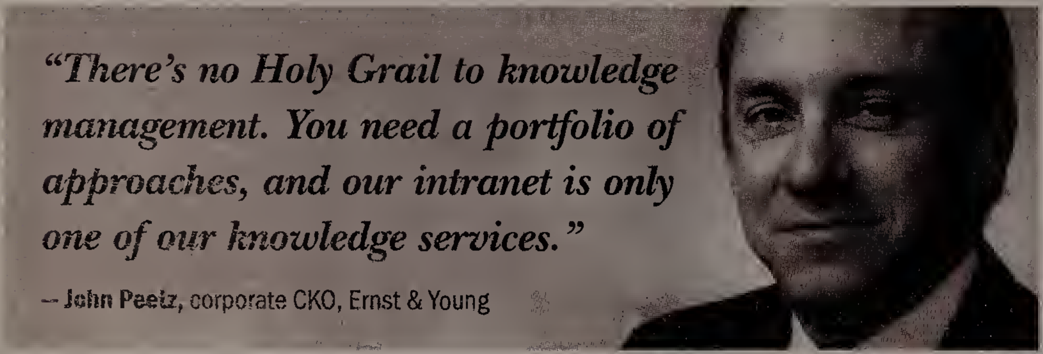
CKO's MISSION

Chief knowledge officers don't sit in their offices all day absorbing business smarts. They perform a number of critical functions at company's with mission-critical information assets. They:

- Keep tabs on corporate resources
- Play matchmaker
- Encourage sharing
- Coordinate and plan with the CIO
- Oversee training (usually)

"Our purpose is not just to be technology-educated and -enabled, but also to share knowledge among the professionals in our organization and bidirectionally with our clients," Knapp says.

Coopers & Lybrand's Knowledge Management Group includes the Learning and Education staff, which handles training; the IT staff; and the Knowledge Strategies Group, which manages corporate information resources such as subscriptions to journals and databases. (For a case study on Coopers & Lybrand's intranet, see *IntraNet*, October 1996, page 26).



"There's no Holy Grail to knowledge management. You need a portfolio of approaches, and our intranet is only one of our knowledge services."

— **John Peetz**, corporate CKO, Ernst & Young

Now, Knapp's priorities are shifting to enhancing extranet interaction with clients and global communications, from the earlier emphasis on the intranet, she says.

"We've forged some successful cross-unit innovation teams, and now I see us getting much more focused on our joint-venture relationships in deploying extranets," Knapp says.

Culture shock

Knowledge management is the reason behind this summer's reorganization at KPMG Peat Marwick LLP, of New York. The strategy includes the appointment of a CKO.

"A CKO needs to deal with issues of a cultural transformation as well as the alignment of knowledge management into strategy, and make the technological commitments, too," says Robert Siboni, deputy chairman and COO.

KPMG Peat Marwick has consolidated departments to emphasize collaboration, which it has named a corporate core value, and continues to build its Knowledge Web, or KWeb, intranet. Siboni appointed what he calls a troika of knowledge management leaders, dubbed the Chief Knowledge Group.

A the firm, the CKO is in charge of strategy and architecture and the other team members coordinate content and technology, Siboni says.

KPMG Peat Marwick employees will be evaluated on their ability to use technology to drive knowledge sharing, Siboni says.

"The most powerful aspect of the Web as a business tool is its community," he adds.

At Price Waterhouse LLP, of New York, Fran Engoron became the first senior partner for intellectual capital a year and a half ago. Engoron and the CIO share corporate knowledge management while she oversees training, recruitment and knowledge asset management. "Technology is a key enabler but is not in itself knowledge management," she says. "Sometimes an elegant technical solution can fail because you do not consider cultural and intellectual issues."

Share and share alike

Especially at consulting organizations, CKOs must get workers to share. That often means a cultural shift, and knowledge managers often take charge of forging those virtual teams across departments and sites.

"We know virtual teaming has succeeded when someone trusts information from a person they don't know and whose name they don't know," Peetz says. And that is increasingly likely in a global organization that communicates over an intranet.

"A CKO really needs to deal with an institutional commitment and alignment of knowledge management into corporate strategy involving human resources and technical commitments."

— **Roger Siboni**, deputy chairman and COO, KPMG Peat Marwick

Information managers are becoming knowledge managers when they build intranets, suggests Edward Shelton, who is CIO as well as executive director of the Surface Ship Directorate of the Naval Sea Systems Command in Crystal City, Va. He says he's "not a techie," but his duty is to solve business problems, and that often means by using technology.

"There's a discrete difference between information and knowledge," Shelton says. "With intranets, you can share information across organizational lines and programs. I see this enhancing the capability of people to be more collaborative, regardless of location," and that helps build knowledge.

This summer, Shelton is launching a 700-person intranet for personnel of the Naval Sea Systems Command. He expects that, within two years, the intranet will grow to support 5,000 people, including some at shipboard Naval IT sites.

Chief what?

CKO duties seem to be emerging in a number of firms, even if the official corporate title isn't appearing on anyone's door.

"Some would argue, myself included, that I have assumed such a role," says Dan Goussy, who manages information technology in the advanced business solutions group of Volkswagen of America, Inc., of Auburn Hills, Mich.

Goussy casts himself as evangelist, urging employees to apply technology appropriately. For example, staff are still learning when to turn to the broader information resources of the intranet instead of firing off e-mail.

"My passion for seeing this intranet come to life and thus changing the paradigm of how information is shared at Volkswagen leads me to believe that I am the CKO," Goussy says.

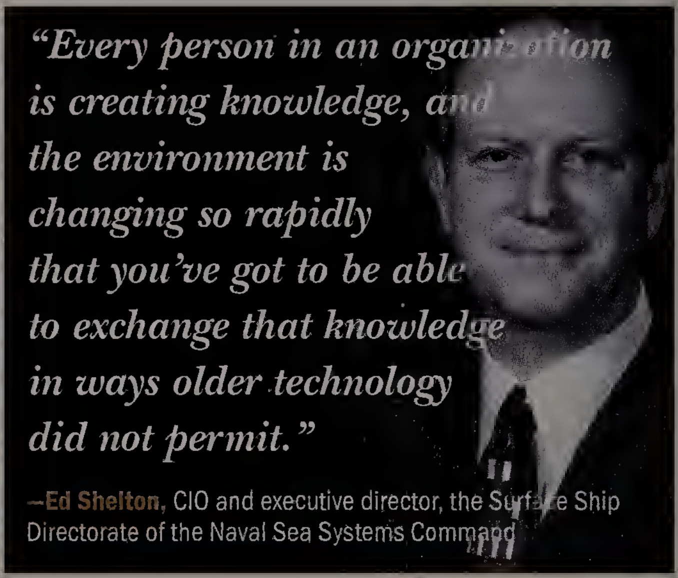
Other intranet managers are both amused and bemused by the term.

Just how much does a CKO need to know to be in charge of knowledge, some wonder. Is it less, perhaps, than a chief wisdom officer?

High-tech companies are known for creative titles such as wizard and technology evangelist, but Ken Ouchi, CIO of Solectron Corp., of Milpitas, Calif., says, tongue in cheek, that his company doesn't have a "designated smart person."

Perhaps the company has a CKO by committee, Ouchi suggests, because some of a CKO's goals are those of several corporate teams at Solectron.

Another technology company, Silicon Graphics, Inc., of Mountain View, Calif., is experimenting with Web-based knowledge-sharing environments. "We make a big deal out of how all our employees are 'knowledge athletes,' but there is no formal position that takes stock of total knowledge assets and ensures we are utilizing them well," says Brett Monello, Webmaster.



"Every person in an organization is creating knowledge, and the environment is changing so rapidly that you've got to be able to exchange that knowledge in ways older technology did not permit."

—**Ed Shelton**, CIO and executive director, the Surface Ship Directorate of the Naval Sea Systems Command

In fact, CKO seems to be a job for a large, diverse corporation. A CIO or CTO will work in small businesses, but a corporation typically decides it needs a CKO when its operations become so dispersed and diversified as to require a coordinator and facilitator.

In this way, naming a CKO is an evolutionary step in a corporation's growth. It comes about when a company separates knowledge management and information technology duties but still urges the two to cooperate. ⊜

For an in-depth interview with General Electric's top knowledge guy, Chief Learning Officer Steve Kerr, see page 23.

INTRA

CUBIC CREATIVITY

Defense firm diversifies in the market and online with a corporate Web.

BY PEGGY WATT

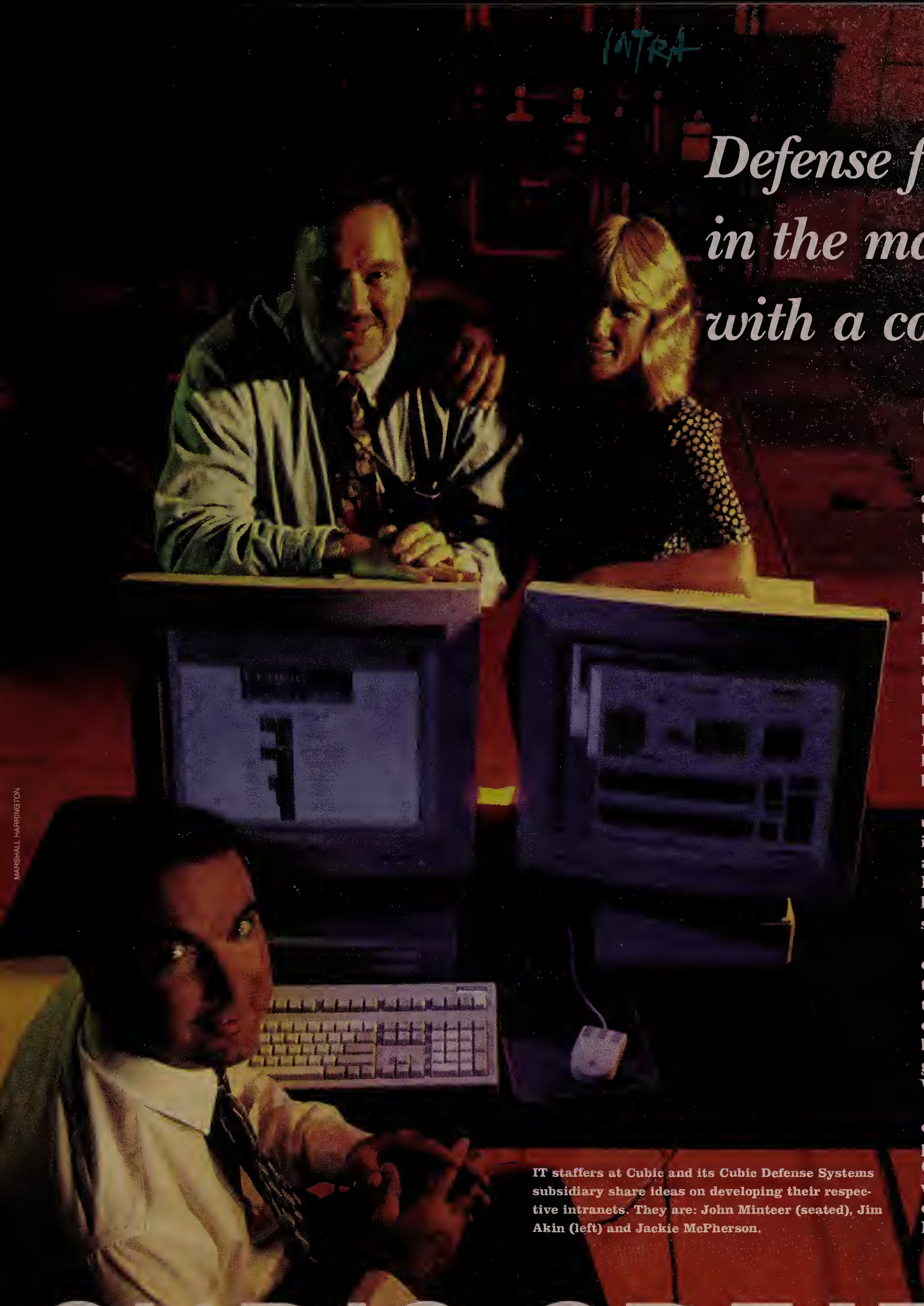
The same creative strategy that helped longtime defense contractor Cubic Corp. diversify quickly at the end of the Cold War has helped the firm boot up its intranet fast.

Faced with a declining defense business, the San Diego company has spawned a half dozen technology-oriented start-ups, building on know-how already in-house. Similarly, IT management realized it had the building blocks for an intranet: A frame relay network ran through the corporate headquarters campus, and leased T-1 lines linked other nearby offices. Companywide, 3,500 clients had Web browsers, thanks to the adoption of NetManage, Inc.'s integrated communications package Chameleon, which contains the WebSurfer browser and basic IP communications utilities.

All IT needed to jump-start an internal Web, figured John Minteer, corporate manager of system integration, was an inexpensive, easy-to-implement application that had an obvious, immediate benefit. He believed an intranet would be useful, but knew he'd have to justify added expenses to cost-conscious Cubic executives.

The first intranet applications featured the IT department. Minteer reasoned that putting support tools online would reduce help desk calls. And, he thought, the Web browser interface could provide easier access to some information the three-member corporate IT staff used to do its job. The strategy was straightforward, but like Cubic's post-Cold War diversification, it has worked.

And it has spread. As Minteer hoped, several other departments within Cubic maintain home pages with starter applications. Likewise, several of Cubic's subsidiary companies are experimenting with Web resources. Minteer adds their links to the corporate intranet home page, which runs on a Netscape Communications Corp. Web server.



IT staffers at Cubic and its Cubic Defense Systems subsidiary share ideas on developing their respective intranets. They are: John Minteer (seated), Jim Akin (left) and Jackie McPherson.

MARSHALL HARRINGTON

Starting simple

IT's initial applications were simple but attention-getting because of their usefulness. For example, users can check to see when and where the staff is running backup operations to find out whether their departmental servers are running. They can request equipment and check on the status of the request. And they can find, operate and even troubleshoot printing operations, using an original application of which Minteer is particularly proud.

"Users can call up a map of all 104 networked printers," Minteer says. "They can click on a printer icon and see whether it's printing now, if it's out of paper, or if it's ready and available."

The next feature, which Minteer expects to implement soon, will let users automatically download the appropriate print driver, he adds. Following that, information on application and file servers on the corporate network will be available in a similar display.

Minteer already considered Web technology a simple, consistent interface to most corporate information, but a couple of immediately useful applications such as these would help prove his case to management. "We need to justify our development," Minteer says. "We don't want it thought that the Web is a toy, so we tend to do the business-return projects first."

Minteer didn't prepare a formal return-on-investment proposal because he assembled the intranet primarily from equipment on hand. But demonstrating its business usefulness will help him expand the project.

CUBIC'S CUES

John Minteer, corporate manager of system integration for Cubic, and Jim Akin, senior technical specialist with Cubic Defense Systems, are working on different intranet initiatives, but their advice for other developers is the same.

1. Make your first applications obviously worthwhile. If you do, it helps justify the investment and expansion.
2. Never put up pages without determining how you'll maintain them. Information should be dynamic.
3. Get several departments involved and evangelize the intranet.
4. Put e-mail links for help and comments on every page.
5. Standardize equipment as much as possible.

Setting an example

Within IT, staff members can browse through a list of equipment installed throughout Cubic and link to a database of relevant information, including the equipment's age, support contract terms, and contact names and numbers. Before, they had to sift through file cabinets for copies of contracts, scribbled phone numbers of support personnel and notes on previous interactions. Now, because the information can be accessed promptly and from anywhere, the staff can deal with problems more quickly and consistently.

The corporate IT staff supports about 1,400 users of the company's 3,500; IT departments in subsidiaries service the others. Several of these spinoffs also have followed the lure of the Web. In fact, one — Cubic Defense Systems, Inc. (CDS), also in San Diego — began building its intranet about a year before the corporate IT department launched its site.

Having Chameleon on almost every desktop made it easier to implement an intranet quickly because the suite contains many of the basic client utilities: browser, IP stack, telnet, File Transfer Protocol and newsreaders. Cubic adopted Chameleon throughout the company for its Network File System connectivity because each site had its own LAN, Minteer says. Besides corporate headquarters and the primary subsidiaries in San Diego, Cubic companies and branch offices are spread across the country.

"We'd had problems handling custom PC applications across the networks and with integration issues," Minteer says. The company installed some Windows NT servers for NT-specific applications, and found NetManage's technology ably supported the Microsoft stack. The Chameleon foundation also supported connectivity with the Unix systems still favored by Cubic's engineering department, so everyone could be on the same network regardless of client, Minteer says.

"Chameleon provides a standard tool set that allows us to train people easily

SITE SEEING

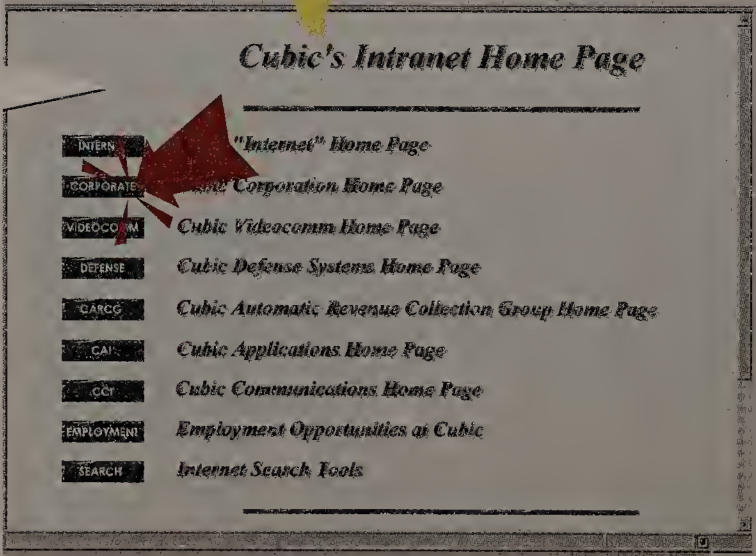
A step-by-step guide to a Cubic IT site

eruse, then print

technical writer at Cubic Corp.'s San Diego campus eds to print out a lengthy file. Printer traffic has en heavy, so the machines have been busy. Before inting her file, she checks current resources by king a simple point-and-click journey through the mpany's intranet.

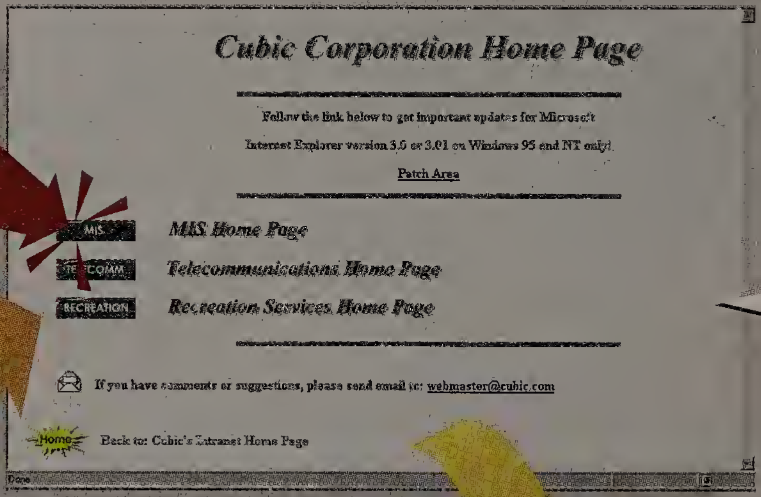
After firing up her Microsoft Internet Explorer browser, she opens the intranet home page, which lists the several Cubic companies that have internal Web sites. She clicks on the Corporate button, which brings her to the corporation's home page.

This user is one of several dozen employees who have Internet Explorer because she has been upgraded to Windows 95. Cubic's intranet has a browser-agnostic design that supports a variety of client systems and browsers, including Netscape's Navigator and NetManage's WebSurfer, on platforms ranging from Unix workstations to Macintosh and Windows systems.



Cubic's Intranet Home Page

"Internet" Home Page
Corporation Home Page
Cubic Videocomm Home Page
Cubic Defense Systems Home Page
Cubic Automatic Revenue Collection Group Home Page
Cubic Applications Home Page
Cubic Communications Home Page
Employment Opportunities at Cubic
Internet Search Tools



Cubic Corporation Home Page

Follow the link below to get important updates for Microsoft Internet Explorer version 3.0 or 3.01 on Windows 95 and NT only!

Patch Area

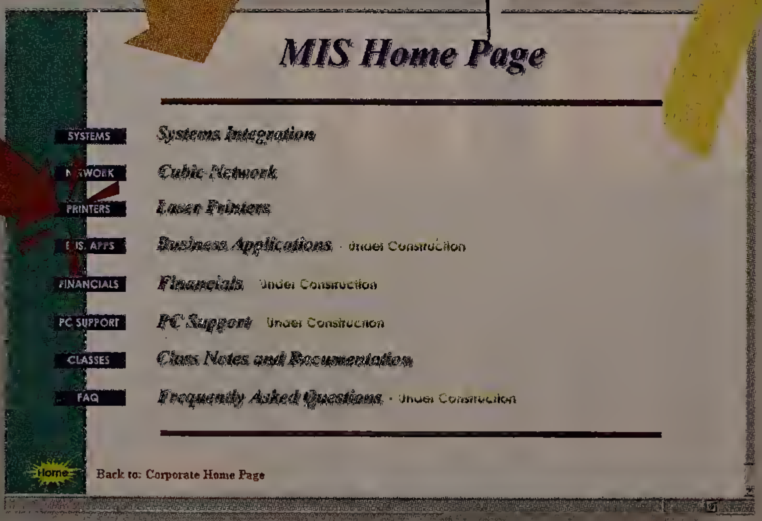
MIS Home Page
Telecommunications Home Page
Recreation Services Home Page

If you have comments or suggestions, please send email to: webmaster@cubic.com

Back to: Cubic's Intranet Home Page

❷ On the Cubic home page, she clicks on the MIS button to get a listing of the IT applications on the intranet. The IT department originated the intranet and remains its largest content provider.

❸ Since she's after laser printer information, she clicks on the Printers bar.



MIS Home Page

Systems Integration
Cubic Network
Laser Printers
Business Applications · Under Construction
Financials Under Construction
PC Support Under Construction
Class Notes and Documentation
Frequently Asked Questions · Under Construction

Back to: Corporate Home Page

because its interface is consistent," Minteer says.

Minteer's group also supports about 20 Macintosh users as well as engineers running Unix workstations; both of those groups run Navigator, as do a few of the Windows 3.1 users. New clients get Windows 95 — about 100 are already in place — and those users typically run the built-in Internet Explorer. The diversity of browsers causes Web page editors to keep their designs simple and universally accessible.

But that's not a problem, says Jackie McPherson, a senior network specialist who taught herself Microsoft FrontPage to design most of the existing Web pages and who, like Minteer, is an intranet evangelist.

McPherson designed Web pages for Cubic's corporate telecommunications department and recreation groups. They're accessible from the corporate home page "so the IT group wouldn't be the only choice" when the intranet went up, she says.

CUBIC'S INTRANET SQUARED AWAY

- 1,400 clients at headquarters run Windows, but the company also supports some Macintosh and Unix workstations.
- 3,500 clients companywide have NetManage's Chameleon software, which includes a browser, an IP stack and telnet, FTP and newsreader facilities, and its Z-Mail Pro e-mail program.
- Netscape Web server software runs on a Sun Netra server.
- Trusted Information Systems' Gauntlet firewall blocks outsider access to the intranet.

On the telecommunications page are news bulletins, equipment request forms, an online discussion group and graphical, online training for new telephone equipment. At the bottom of every page is a link to send e-mail comments to both the content provider and the IT department.

Interest is stirring in other departments now. A human resources page is in development while job listings already are posted on the internal Web.

Teaching the parent

From down the street, CDS has offered a few tips to its corporate parent. CDS launched its intranet site about 18 months ago, a year before the corporate-run site went online.

CDS uses O'Reilly & Associates, Inc.'s WebSite server and WebBoard 2.0 conferencing and real-time chat system. The latter is the attention-getting application IT used to successfully entice its approximately 1,000 users, says Jim Akin, a senior technical specialist.

However, now that the corporate offices have caught intranet fever, Akin expects the IT departments will duplicate their tool sets to allow redundancy and backup operations. His users also run Chameleon's WebSurfer, although new desktops get Windows 95 and Internet Explorer.

CDS' Web site started with IT pages offering support information. But, in Cubic style, it quickly diversified. Golf tournament scores proved an attraction, as did the chat room, software quality control specifications and other engineering resources, Akin says.

Akin encourages departments to post material, but gives them the responsibility for maintenance.

"I'm not much of a Webmaster," Akin says. "I'm the granter of licenses. As soon as a department evinces interest, I give them keys to the kingdom and tell them to have a good time."

Akin's plans for Web development primarily involve providing Web access to a number of SQL databases. "We have some databases in our components and standards group that people now can only get by walking to the department and reading through a book or logging on to a PC onsite there," Akin says.

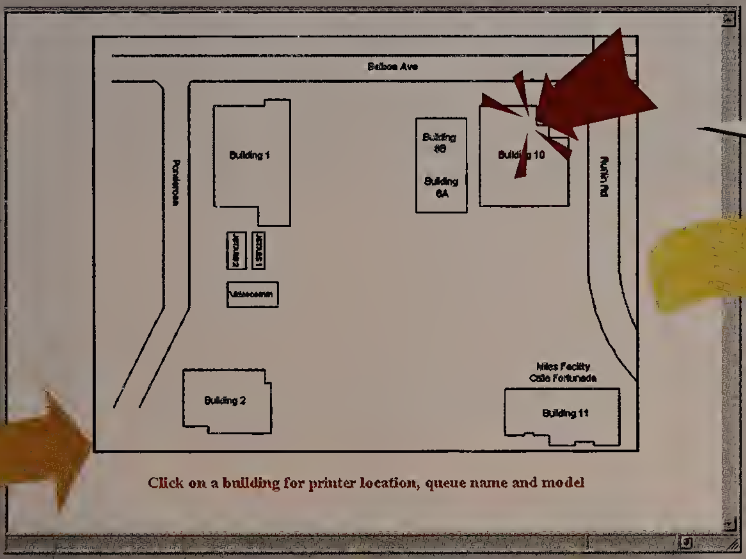
By the end of summer, Akin adds, the information on those databases will be universally accessible via a Web browser.

"The big selling point is that in the future, it will be easier for people to do business this way, especially when they are scattered across several locations," Akin says. "They can look up things in a database through a browser instead of through some client/server situation."

Back at headquarters, Minteer says he urges intranet builders to emphasize applications that have the biggest impact for the most people.

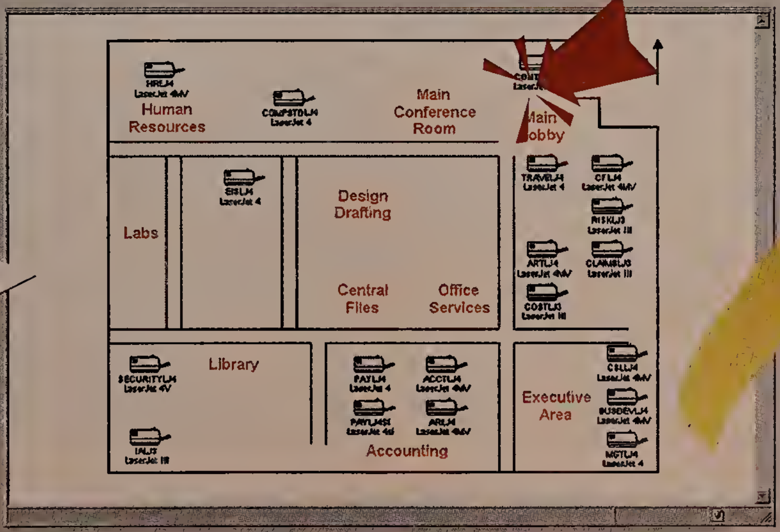
"We're trying to focus on high-use features and get people using the Web pages," Minteer says. He's not opposed to golf scores, either; the recreation pages have lured employees to the Cubic internal Web.

The intranet is young, Minteer notes, but the future is promising. ⊜

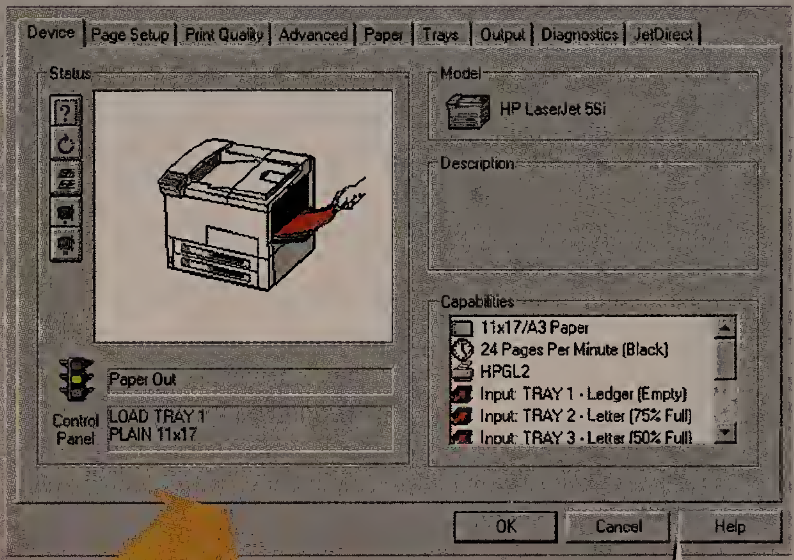


Click on a building for printer location, queue name and model

4 A map of Cubic's San Diego campus pops up. She clicks on the building in which she works to narrow the search for an appropriate printer.



5 That click on "Building 10" brings up the facility's floor plan. The plan includes icons of all printers housed there. Each icon is accompanied by the printer name, type and security level if relevant (since not every employee can go into every section). To check availability, the tech writer clicks on the icon representing the printer that's closest to her office.



Status: Paper Out

Control Panel: LOAD TRAY 1 PLAIN 11x17

Model: HP LaserJet 5Si

Description:

Capabilities:
- 11x17/A3 Paper
- 24 Pages Per Minute (Black)
- HPGL2
- Input: TRAY 1 - Ledger (Empty)
- Input: TRAY 2 - Letter (75% Full)
- Input: TRAY 3 - Letter (50% Full)

6 The last click produces a graphic displaying the status of the chosen printer, which, in this case, is out of paper. She also can see whether the printer is offline, what size paper it contains and whether other print jobs are queued up.

Your Intranet.
As easy as pushing a button.

Today, more and more companies are beginning to understand that the Internet and Intranets can improve their business. You want easy, trouble-free solutions—from a proven company—that take advantage of your existing infrastructure. Together, USWeb and Microsoft are dedicated to one goal: bringing the highest level of our combined experience in technology and solutions to give your business a competitive advantage.

USWeb is a leading international company that provides businesses with comprehensive consulting and Internet and Intranet development services. USWeb builds and deploys business-critical application solutions that can improve marketing, customer service and support, human resources, manufacturing and operations automation.

Microsoft's expertise in Web technologies is well known, including its robust ActiveX platform that provides scalable, mission-critical applications that can be integrated with your existing applications.

*To activate the Web for your business, call us at **1-888-USWEB-411, ext. 270**, or visit our Web site at **www.usweb.com/ms6**.*

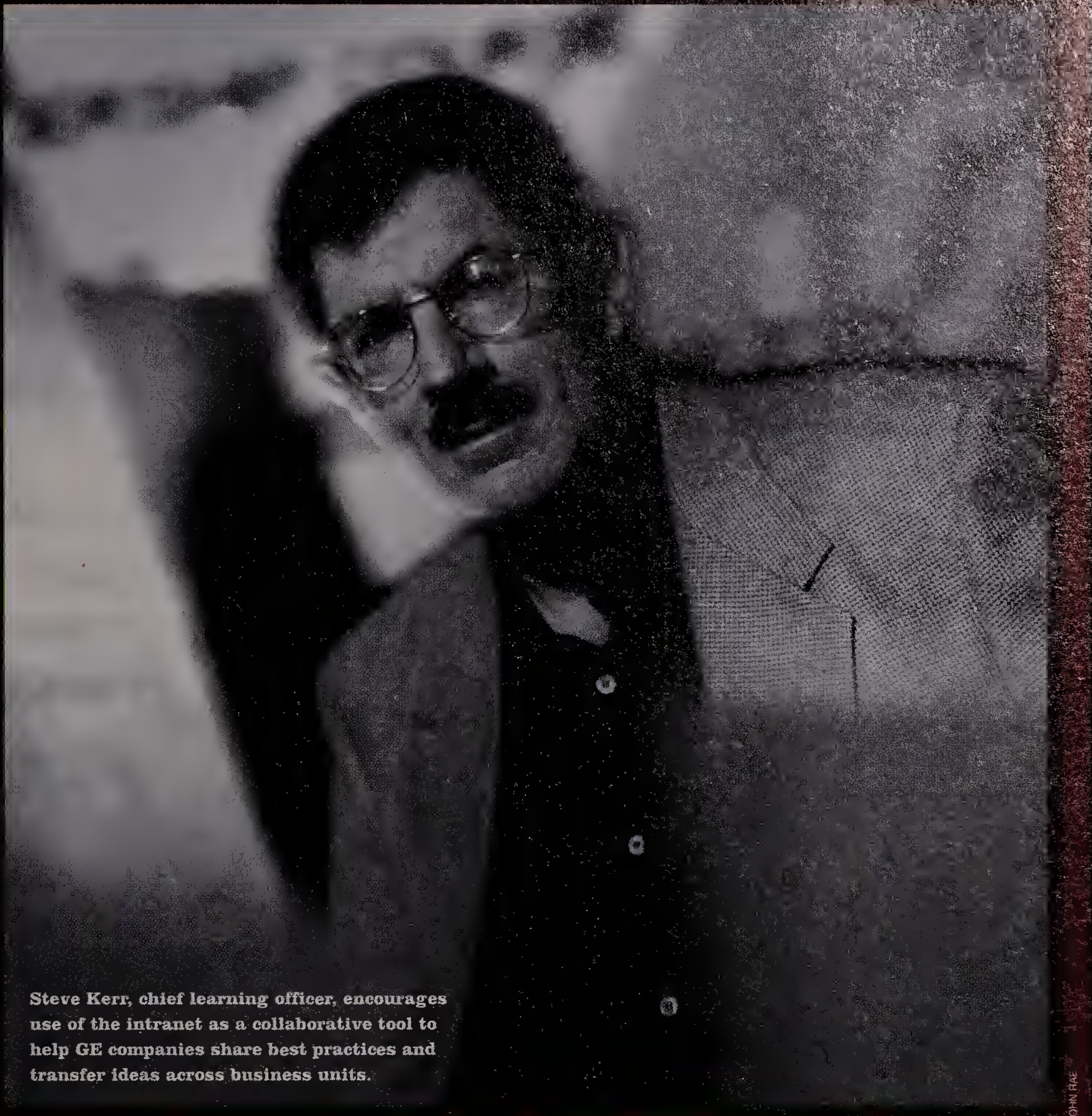
Microsoft® USWEB™

Activating the Web for your business.™

©1997 USWeb Corporation. USWeb and "Activating the Web for your business" are trademarks of USWeb Corporation. Microsoft and ActiveX are registered trademarks of Microsoft Corporation.

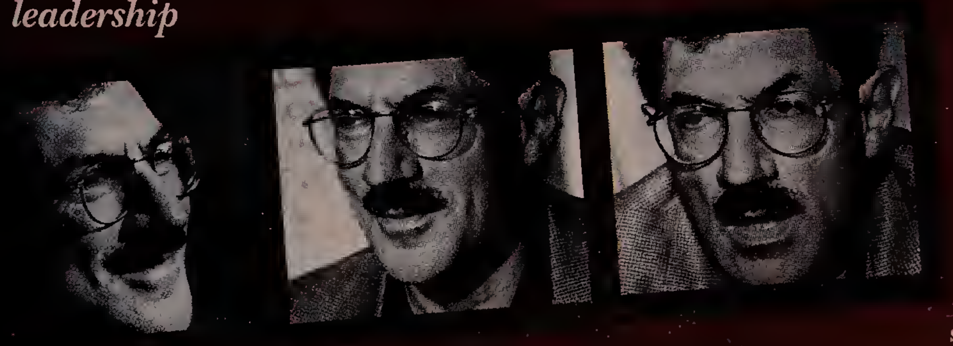
Where learning counts

Along with promoting collaboration through an intranet and global e-mail system, General Electric Co. has appointed a chief learning officer to help leverage the diverse expertise in this $79 billion company. Steve Kerr, who also is vice president of corporate leadership development, is a self-described matchmaker who encourages knowledge-sharing and knowledge-enhancing practices that often draw on internal Web resources. He spoke with Senior Editor Peggy Watt about his corporate education philosophies and methods.



Steve Kerr, chief learning officer, encourages use of the intranet as a collaborative tool to help GE companies share best practices and transfer ideas across business units.

JOHN RAE



So what is a chief learning officer anyway, and how does it differ from a chief knowledge officer?

The glib answer for why we have a CLO instead of a CKO is that knowledge is a noun but learning is a verb. Chief knowledge officer sounds enough like chief information officer that some people think that's what a CKO does, and sometimes it is. But if your goal is to change knowledge, well, you're talking about changing synapses in the brain. It's an impossible task to measure. But learning is a permanent change in behavior, and that's much more addressable and more measurable. I got the title of CLO at a Work-out [GE's departmental, off-site idea-generation meeting] about three years ago.

Why this new duty — are you trying to change the culture along with introducing new communications tools?

In terms of what we do and why it's important, [business and social commentators Alvin] Toffler and [Lester] Thurow have given this more thought than I have. Information is something you can give away and still have. In fact, it increases in value when more people have it; it's a portable commodity.

General Electric is the most diversified, integrated corporation in the world. You could subdivide it into 22 Fortune 500 businesses. It includes financial services, a television network, transportation systems, appliances and so on. On its face, nobody could believe you could be in that many businesses without being a holding company or a conglomerate. Moving money around in a business is not easy, but it is straightforward. Moving people around is very important, and GE does it better than most.

As to moving ideas around diverse businesses that don't have a lot in common, GE does this because it has to. If it doesn't, then it is just a holding company. And moving ideas won't happen naturally in a place as big as GE.

My title came about as a way to encourage new thinking, to emphasize the importance of moving ideas around, to underscore that this is important enough to give someone a job title. Our goal is to foster learning and share knowledge. There's an adage that ability multiplied by motivation equals performance. You've got to make people able to perform and want to perform.

Why does a company need a chief knowledge officer or a chief learning officer? Why doesn't this just happen naturally? In most organizations, there are predictable barriers to creating a learning organization if you don't intervene. Many people don't share ideas because they like to hoard ideas. Traditionally, having the best process or the best practice gets you recognition, so

"As to moving ideas around businesses that don't have a lot in common, GE does this because it has to. If it doesn't, then it is just a holding company. Moving ideas won't happen naturally in a place as big as GE. My new title came about as a way to encourage new thinking, to emphasize the importance of moving ideas around, to underscore that this is very important

> "Why does a company need a chief knowledge officer or a chief learning officer? . . . In most organizations, there are predictable barriers to creating a learning organization if you don't intervene. . . . In traditional organizations, having the best process or practice gets you recognition, so people tend to hoard information. The purpose of a learning organization is to share."

people tend to hoard information. The purpose of a learning organization is to share.

The flip side of hoarding is boasting. Many people feel funny about claiming to have best practices, but this must be encouraged. For example, if you're in a regional office, you probably don't know whether what you have is a best practice that should be shared because you're isolated. Even if you want to share and feel confident, how do you go about informing the rest of the organization? Methods for sharing are not in place in traditional organizations.

In addition to the barriers inherent in transmitting information, there are potential barriers to receiving information. The 'not invented here' syndrome is a big one.

Also, knowledge that's sitting somewhere else never looks portable. When you show somebody a best practice, the first sentence in response is always, 'That's really interesting.' Then the next sentence always starts with, 'But you've got to understand that, unlike them, we're a long-cycle business,' or 'But we have unions' or 'But they have only one product line.' Everyone is articulate about their own uniqueness, and everyone is right. They are unique, but if you over-respect that uniqueness, nothing is portable.

I'm hardly the only one in GE charged with doing this, but my job is to overcome these barriers so it's more likely that people will transmit and receive information.

It sounds hard to quantify. How do you know when you're succeeding?

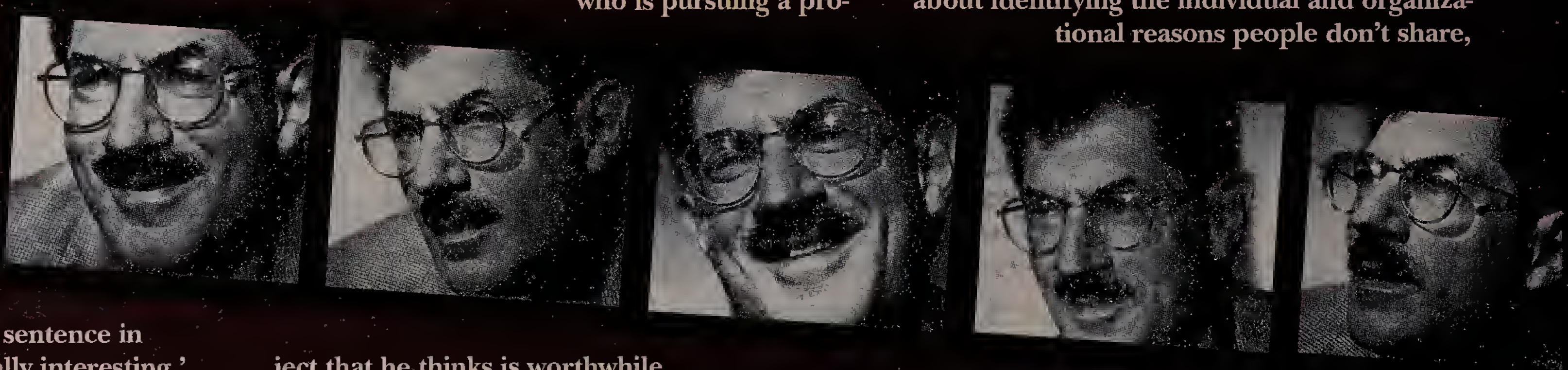
We've had some tremendous successes, but you can't apply rigorous tests to measure success in this arena. One thing you do is accumulate anecdotes. We have numerous examples of successful exchanges between businesses as diverse as aircraft engines and medical systems, or between a transportation business and government contractors.

For example, a breakthrough in GE's Medical Systems business, with relatively little modification, led to a method by which an aircraft engine can transmit continuous information about blade speed, engine heat and other relevant data about its in-flight performance well in advance of any possible safety situation. This innovation, in turn, catalyzed an important new development with respect to a self-monitoring system for use with heart pacemakers. I could cite any number of other examples having to do with sharing methods of selling, sourcing techniques, procedures for improved storage and security of data and so on. The key thing to keep in mind is that every business has essentially the same mission: to take inputs, which are basically the same for everyone — money, people, energy and so on — and, by employing various throughput activities, convert these inputs to some bundle of services and products.

Do we find every opportunity to share information that's there? Of course not. Who knows how many we miss? But if you go in with the mind-set that there have got to be best practices to share across functions, departments and businesses, and you're always looking for them, you're much more likely to find them.

So you act as a facilitator?

It's kind of a brokering job. I am a matchmaker. I don't know all this stuff myself, but I can act as an integrator when people call me. I'm a central repository, and sometimes a traffic cop. You need a one-stop shopping center, a kind of 911 number that people can call and say, 'I think I have something worthwhile here.' For example, I may get a call from a business leader who is pursuing a project that he thinks is worthwhile, but he's afraid the company will not continue to fund it. I can sometimes help with a situation like that; I can take a look at it and, if it looks good, make an endorsement. It's a little like declaring some building to be a historical landmark, which means that people aren't supposed to tear it down. Sometimes I'm not the right person to assess a proposed best practice, but I can get in touch with whomever is the right person. Of course, if this best practice is costing too much money, the business will tear it down irrespective of any endorsement about its potential for learning. But at the margin, it's a way of identifying best practices and permitting them to have a chance to survive and propagate.



So far I've focused mainly on how GE improves people's ability to transfer knowledge. It's also important to make people want to. In this respect, the support of [GE Chairman and Chief Executive Officer] Jack Welch is indispensable. Through his efforts, I think everyone in GE knows that hoarding ideas is not a career-enhancing move. He has not only developed systems to move knowledge around the company, but also has created incentives to do so and disincentives to hoard information.

What kind of technology does GE use to facilitate this effort? And how do you coordinate your efforts with CIO Gary Reiner?

GE takes advantage of a wide variety of informational technologies. We make good use of the Internet and our own intranet, for example, and have invested in a variety of CD-ROM, telecasting and multimedia-based educational initiatives.

One of my major objectives is to create a virtual Crotonville [on the intranet], which will be a resource for all the training materials in different forms. The virtual Crotonville includes online resources, CD-ROM, multimedia, business TV — all the devices with which you can reach out to someone who isn't physically there.

The reasons for this are twofold. First, as organizations de-layer and downsize, there are fewer locations with large numbers of employees. Second, the more you globalize, the more locations you have, and some of these cannot afford to send many people to Crotonville. So it is imperative that we develop new ways of reaching out to and educating these people. Gary Reiner and I work closely together on a number of corporate projects and initiatives.

How will intranet-based tools help you with your mission in the future?

CIOs worry a great deal about things like security, compatibility and intellectual property rights. But I still believe the most important reason people don't share information is because they don't want to. In my job, I worry more about identifying the individual and organizational reasons people don't share, and so you give them incentives to share.

Once people want to share, the intranet is increasingly used to do so — and as the channels of communication change, the nature of communicating changes. The pipeline can be as clever as you want, but you need a receptive person on the other end. If you can become boundaryless in your practices, the intranet becomes a wonderful resource.

I think all of us are going to look at the late '90s and chuckle, like we do now when we look at the UNIVAC as a giant brain. At first, we used computers to do the same stuff faster, but what's the new stuff you couldn't do before? Maybe what Reiner is doing is helping people become more able to communicate, and I'm making people more willing. Consider again the equation ability multiplied by motivation equals performance, and that's our mission. I think we're each working on the other's side, too.

Is this trend of charging an executive with knowledge development and learning promotion a '90s fad, or is it a long-term shift for corporations?

Regardless of whether the title of chief learning officer is permanent or just a fad, the responsibilities attendant to the position are critically important, and will continue to be. Especially in large, differentiated global firms such as GE, huge returns can be realized from being able to create, acquire, interpret and transfer learning from outside the organization and from one part of the firm to another. ≡

NEW FROM ▶ ▶ ▶ ▶

ASCEND

Series56 Digital Modem Modules

- ISPs
- Corporate Networks

Upgrade MAX™ & MAX TNT™ WAN Access Switches to the latest standard

8-,12-,16- and 48-Port Digital Modem Modules

Based on K56flex Technology

DSP-Based Architecture

Allows for hierarchical processor system which boosts performance

Internetworking Specialists

CAPELLA W·O·R·L·D·W·I·D·E

Call Capella Worldwide today

1.800.591.4264

or contact your local Capella representative

e-mail: info@capella.com • www.capella.com

Reader Service No. 165

Catch your best prospects with WebWares™ in *IntraNet magazine.*

Don't miss the September 22 issue!

Close Date: August 22

Bonus Distribution: NetWorld+Interop, Atlanta

Call 800-622-1108 ext. 507

WEB HOSTING

tiac web hosting

- 24 hour customer service
- web hosting and design services
- t3 internet backbone

617.932.2000

mention ext. 3008 for our money back guarantee

TIAC

Reader Service No. 190

To place your ad here call Enku Gubaie at 800-622-1108 ext. 465

ISP's How Do You ReBoot Remote Equipment?

Now with Sentry, you can reBoot any locked-up internetworking device through a standard dial-up modem, over an ethernet network or via TCP/IP using Telnet. The Sentry family of products provides an easy, practical, and secure solution for power management of remote internetworking equipment. Select the Sentry model best for you.

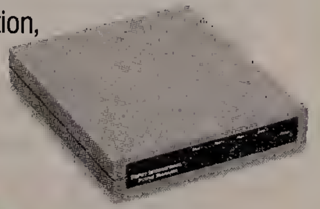
- Quickly respond to remote equipment problems
- Reboot locked-up routers and modem banks
- Shutdown and reboot locked up NT and UNIX servers
- Keep customers on-line and happy
- Meet and exceed service levels

Sentry/R for Equipment Rooms

Our Sentry/Rack product is designed specifically for rack-mounted equipment. Simply install a Sentry/R into your rack, plug in your devices and you're ready. Using either in-band or out-of-band communications, Sentry/R will individually control the power status of each connected internetworking device.

Sentry/I Desktop Model

Sentry/International is an entry-level model designed specifically for the user who needs out-of-band power control for several devices. Sentry/I works with a reliable dial-in modem connection or an RS-232 connection, giving you secure password-protected power control over each connected device.



ISP's, Call For Discount!

Another great product from

Server Technology Inc.

© 1996 Server Technology Inc. Sentry is a tradmark of Server Technology Inc.

Contact us at:

Web: www.servertech.com

Phone: 1-800-835-1515

or 1-408-745-0300

Fax: 1-408-745-0392

Reader Service No. 185

Intranet Solutions

- Remote and Local Servers
- Complete Database Solutions
- Sales, Marketing and Advertising
- Order Entry, Tracking, Customer Support

Interactive Web

- Fully Interactive Databases
- IShop Virtual Shopping Carts
- Membership Systems for Private Sites
- Sticky Pages, Virtual Pages, Chat Rooms

Custom and Rentable Solutions For Intranet and Interactive Web Sites

www.cookware.com

(317) 769-5049

Reader Service No. 169

Intranet Fax

◆ SWIIFT - The Future of Computer Fax ◆

Move beyond traditional Client/Server fax - move to Faximum SWIIFT (Suite of Web and Internet/Intranet Fax Tools). Fax-enable your web and email servers. Let your users send and receive faxes using only their existing web browser or email program. The future fax client is no fax client at all; no fax client software administration; **no fax client charges!** For more information and demonstrations, visit our web site.

Faximum

(604) 925-3600

fax: (604) 926-8182

email: info@Faximum.com

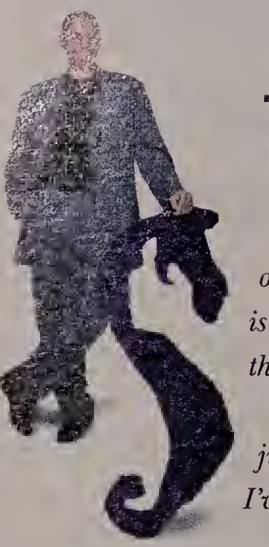
www.faximum.com

now on NT

UNIX and NT

Product names may be trademarks or registered trademarks of their respective companies.

Reader Service No. 187



Take the Intranet Webmaster Test

So you've got an intranet, and things are pretty cool. Content is growing explosively, users are amazingly enthusiastic and the CEO is impressed. Pretty pleased with yourself, eh?

Hold on a second. Are you really that *good? To find out just how much of an intranet jock or jockess you really are, I've developed the Gibbs Intranet Webmaster Test.*

1. How did your intranet start?
a) You realized the potential of an intranet, so you developed and presented a business plan to senior management. The company rewarded you with a budget and the resources to develop and run a top-notch intranet.
b) You downloaded a freeware Web server and started running it on an old 486 under Linux so you could create an archive of dirty jokes for the technical support staff.
c) By the time you got around to thinking about an intranet, users already had developed sites for the accounting, human resources and sales departments.

JOEL NAKAMURA

2. How did you create a user-driven publishing environment?
a) You created a user intranet committee, initiated a training program for educating users and distributed a range of templates specifically designed to support each department's information capture and distribution needs.
b) You gave the users a subdirectory and e-mailed them a FAQ on HTML, telling them it's a "piece of cake" to write.
c) You haven't. The idea of users creating content fills you with horror and despair.

3. How did you choose your intranet servers?
a) You thoroughly researched the marketplace, checked out what people had to say in various newsgroups and read trade publications for reviews and comments.
b) You went to CompUSA and bought the first Web server you saw.
c) You're still using a freeware Web server written in LISP because Bill, your Unix guru, thinks it's really neat.

4. How does your intranet connect to the Internet?
a) You have a dedicated high-speed connection. If it fails, traffic flows to a backup link via an Internet service provider that connects to a different top-level backbone than your primary ISP does.
b) All users have dial-out connections to any of three local ISPs.
c) What a novel idea! But why?

5. What security measures do you have to protect against hackers?
a) You have firewalls surrounding a screened subnet for your Internet connection and firewalls between network segments. You've also drafted in-depth management policies regarding user access and engineering work management that you back up with extensive auditing and firewall log analysis.
b) With only dial-out connections, there's not much of a problem.
c) What's a hacker?

6. What search engine do you use?
a) You use a top-end product such as AltaVista or Excite. Then, to ensure it doesn't miss anything, including new servers, you regularly do a port scan of every node on your intranet and run a Web crawler at least once a week.
b) Users are expected to maintain topical lists when they create Web content and to link the lists to a central index.
c) If the users don't know where to find it, who cares?

7. How do you handle requests from departments that want to make large, complex databases available on the intranet?
a) You conduct a formal systems analysis to determine whether you can use off-the-shelf tools. If you can't, you develop a detailed project plan that integrates existing client/server, object-oriented and Web server application development methodologies. You follow this with a staged rollout that includes frequent quality control checks and usability testing.
b) You "hack" a solution using a database on a SPARC-2 server.
c) You tell them it can't be done.

8. How do you define and publicize what is and is not acceptable on your intranet?
a) You have a formal acceptable use policy that includes a foreword by the CEO. HR distributes the policy, which users must sign and return. Managers can deal with infractions of the policy through formal disciplinary procedures.
b) You send out an e-mail message that lists the dos and don'ts.
c) If you think a user has done something unacceptable, you delete his or her subdirectory and claim that a problem with the backup system has rendered the files unrestorable.

Score three points for each "a," two points for each "b" and one point for each "c."

If you scored 21 to 24 points, you are a first-class intranet manager and damn-near god-like. You should command a salary of at least $100,000 and have a benefits package that makes lesser mortals cry.

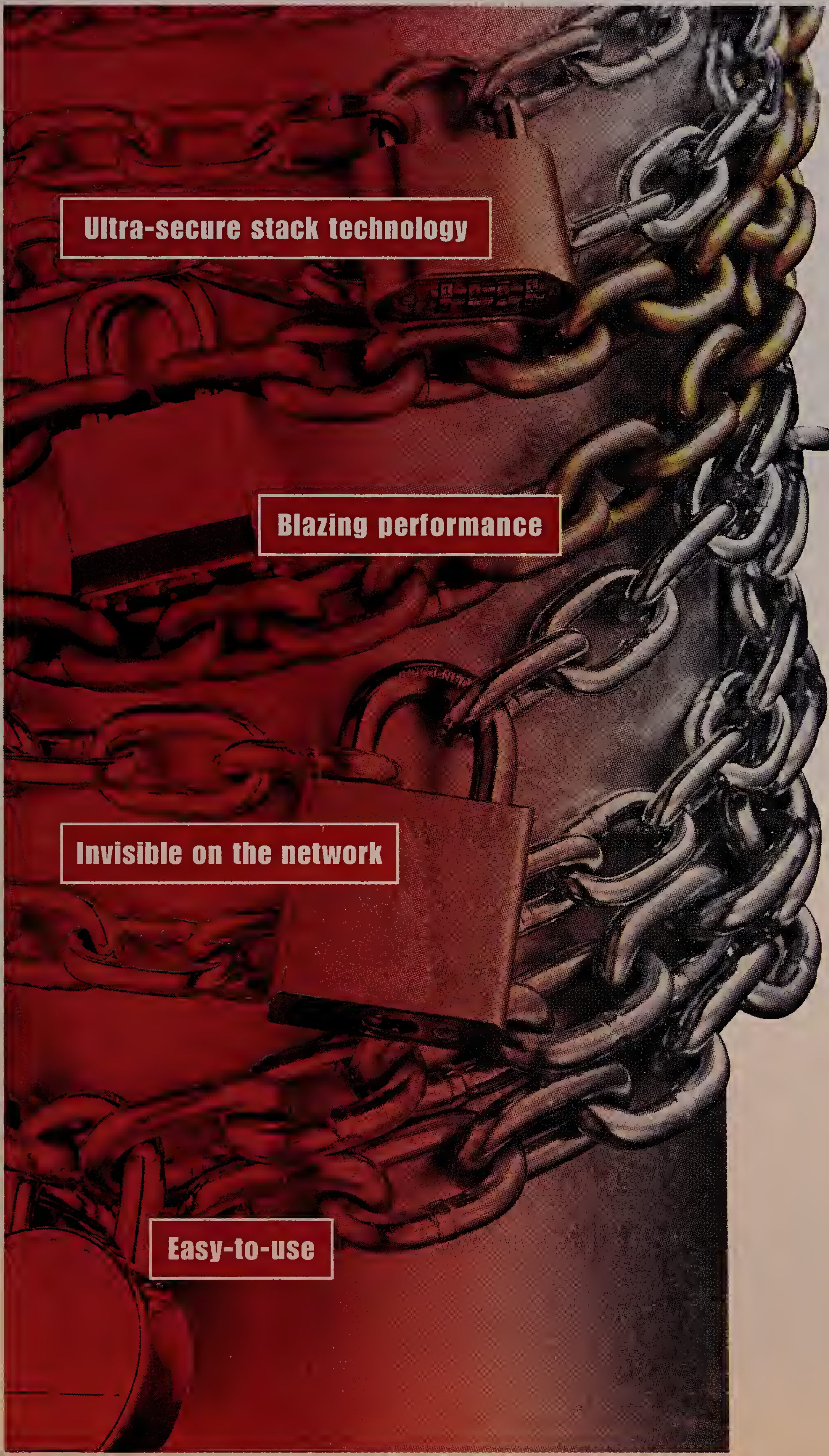
If you scored 13 to 20 points, you need to work on it. You should command a salary of between $40,000 and $80,000 and, other than medical and dental, you probably only get access to free coffee.

If you scored 12 or less, you are in deep trouble.

What did you score? Leave your confessions at imcolumn@gibbs.com or (805)644-4999.

SecurIT FIREWALL

Milkyway has Network Security all Wrapped Up — Now on Windows™ NT



Announcing SecurIT FIREWALL for Windows™ NT from Milkyway Networks.

The key is our patented Black Hole™ Stack Technology.

By replacing the Microsoft Stack with Milkyway Networks' Black Hole Stack technology, our SecurIT FIREWALL eliminates the weakest link in Windows NT. Other NT firewalls only use wedge driver software, thus leaving the stack open to attack. Only SecurIT FIREWALL eliminates vulnerabilities at the source.

Blazing performance without compromising security.

SecurIT FIREWALL exploits all the advantages of NT's multi-threading capability to give you the blazing performance you need without compromising network security. Many of today's "quick to market" NT firewalls are UNIX ports which sacrifice security for performance. With SecurIT FIREWALL you have a firewall designed for NT that never compromises any aspect of performance or throughput for security.

Easiest to install, easy to use.

You'll install SecurIT FIREWALL in ten minutes or less. A native GUI, not a UNIX port, makes the administration of the industry's most powerful policy engine easy and efficient. And your users will find SecurIT FIREWALL easy to use as well. With no client software or IP address to worry about they'll simply fire up the browser and SecurIT FIREWALL will do the rest.

Now's the time to wrap up all your network security with SecurIT FIREWALL from industry leader Milkyway Networks.

1.800.206.0922
http://www.milkyway.com

MILKYWAY NETWORKS

© Copyright 1997 Milkyway Networks Corporation. Black Hole is a trademark of Milkyway Corporation. Windows and Windows NT are registered trademarks of Microsoft Corporation. All rights reserved.

Circle Reader Service **#6**

WANT PLUG-AND-PLAY NETWORK PERIPHERALS?

THINK THIN

MAKE YOUR NETWORK PERIPHERALS HUM WITH THINSERVER™ TECHNOLOGY PRODUCTS, ONLY FROM AXIS.

Think print servers are a good idea for your network? You should see what Axis Communications is up to now.

Using ThinServer Technology, our complete line of products make it easy and affordable to connect your peripherals to any size LAN, from workgroups to the enterprise. Put live pictures on the Web and Intranets for monitoring and security with our Internet Camera server. Access CD-ROMs across your enterprise with our AXIS StorPoint CD™ server. Share Iomega® Jaz™ removable drives with our AXIS StorPoint HD/4 Jaz™ tower. And more ThinServer peripheral products are on the way — including the latest advances in print servers.

ThinServer Technology includes "thin" versions of the most popular network operating systems, Web management tools and Axis' own ETRAX 32-bit RISC processor — based on open architecture, streamlined and optimized for device connectivity, independent of any file server. So you can keep network traffic to a minimum and offload your file servers.

It's an idea whose time has come. It's revolutionizing the way users access peripherals over the network. And it's only from Axis Communications.

Free White Paper! To receive a free White Paper on ThinServer Technology, visit our Web site at **www.axis.com** or call us at **800-444-AXIS***. And see how peripheral servers can give your network new life.

What is ThinServer Technology?

It's a breakthrough technology that makes peripherals of all kinds "network-ready."

ACCESS EVERYTHING WITH THINSERVER™ TECHNOLOGY

Access everything from printers and storage systems to digital cameras and CD-ROM drives — with no intermediate PC client or server. Your customers' peripherals work faster and smarter.

Everything is plug and play!

AXIS®
COMMUNICATIONS

Axis is a registered trademark, and StorPoint CD, StorPoint HD/4 Jaz and ThinServer are trademarks of Axis Communications AB. All other company names and products are trademarks or registered trademarks of their respective companies.

* GSA prices available. Call for more information.

Circle Reader Service #7

Mail

Continued from page 35

Microsoft Mail shop, but with that product reaching the end of the line, the company had to make a decision for its 7,000 end users, many of whom work at remote locations. As a consulting firm needing to manage lots of information, Booz, Allen & Hamilton already had been using Netscape's browser as a front end for its custom online knowledge application and as an interface for searching documents.

"With the hardware being Mac and Intel, we needed a product with high connectivity that was very open, so the Netscape browser became a major part of our architecture," CIO Walters said. "The natural migration after the browser is the mail system and connecting knowledge management and the mail together."

Also of importance was a product that supported Simple Mail Transfer Protocol. "We prototyped other SMTP products a year ago. They were OK, but they weren't fully functional," Walters said.

Netscape has led the standards charge as competitors have worked to retool their feature-rich proprietary products to support standards. But Netscape has to fill in its functionality gaps and better integrate Communicator pieces to catch up to its rivals, Gartner Group's Austin said.

Gartner Group is advising clients to wait six months before doing any broad-scale Communicator deployments because, like any ".0" release, the product has some bugs that need ironing out.

Another leap that Netscape must convince customers to make is replacing their existing directories with its core directory, which relies on the Lightweight Directory Access Protocol (LDAP). If companies want the enhanced administration capabilities Netscape promotes, they must adopt the directory structure.

"If we looked out our window and saw a clear field with no directories, groupware and mail systems already installed, indeed the Netscape LDAP vision is compelling," said Tim Sloane, director of Internet infrastructure research with Boston-based Aberdeen Group, Inc. "But I see a substantial part of the market already with directories and electronic mail installed and maybe 30% with some groupware functionality. What Netscape doesn't have is a strong coexistence migration strategy for that installed base."

Despite the challenges, many analysts predict that Netscape will be able to snare enough market share to survive in its battle with the groupware/messaging giants.

"There are many companies out there that have built a first-generation e-mail system largely on the backs of LAN-oriented technologies," said Geoffrey Bock, a senior analyst with Boston-based Patricia Seybold Group, Inc. "Most of those companies should actively be considering moving to IP networks and the Web and embracing a standards environment."

Netscape should be a strong contender for new business in that it offers a native IP environment, Bock said. "The Exchange and Notes solutions are not native IP at the same level," he said. ■

Netscape is a contender, according to columnist James Kobielus. Page 49.

NYL

Continued from page 40

tomer then can download account information or outline a model loan, among other things.

The company's Web server supports between 40- and 128-bit encryption.

For customers who want the higher level of encryption and whose software supports it, they can have 128-bit encryption. The server will drop down to the lower level of security for other users. Since the Web site is serving up financial account information, Vangel said it was important to provide solid security. ■

USER EXCELLENCE AWARDS COMPETITION

Win a night on the town

All entries must be received by Sept. 1, 1997, and must include your name, title, company name, address and phone number. Please note: Entries will be accepted only from user organizations; no vendors or consultants, please.

Deadline: Sept. 1, 1997

HOW TO ENTER:
Send your entry to excellence@nww.com, or fax it to (508) 820-1103. You can enter via Network World Fusion (www.nwfusion.com) using DocFinder 3318.

ENTER THE NETWORK WORLD USER EXCELLENCE AWARDS COMPETITION

YOU COULD WIN A NIGHT ON THE TOWN

You work hard. We think you should play hard, too. So we're willing to treat the winners of this year's User Excellence Awards competition to an elegant dinner for up to 10 members of their departments.

Network World's User Excellence Awards honor the innovative and effective use of network technology to achieve corporate objectives.

WHAT YOU HAVE TO DO

In 750 words or less, tell us about your latest network project triumph. Entries must include:

- The business case: Explain how your network project helped further your company's business goals.
- The technology case: Explain why you made the choices you did.
- Costs and benefits: Give specific figures that detail what your project cost and how it contributed to the bottom line.

WHAT YOU GET

- A T-shirt. Everyone who submits a completed entry — those that address all three issues — will receive a Network World T-shirt.
- Recognition. Winners will be featured in the special year-end "Power Players" issue of Network World. They also will be honored at an awards ceremony at the ComNet conference in Washington, D.C. early next year.
- A chance to have dinner on us. If you win, we'll pay for dinner at the restaurant of your choice for up to 10 members of your department (up to $1,000).

So go ahead, blow your own horn.
We'll be listening.

Network World

'NET INSIDER

False idol?

There sure has been a lot of talk of "Fast Token Ring" in this paper over the last month or two. First it looked like Fast Token Ring nirvana was going to pass us by, but now it looks as if it will happen after all. All this talk has been puzzling and frustrating in a number of ways.

Much of the commentary has repeated the old "Ethernet is bad, token ring is good" falsehoods. It is claimed that Ethernet collapses under high loads, has unpredictable performance and is wasteful of bandwidth with all those collisions.

These assertions developed in the early days of token ring and were used by IBM salesmen to try to convince people to use token ring rather than Ethernet. It is amazing to see that people still accept what are essentially old marketing ploys.

As early as 1988, Digital Equipment Corp. published a research report that demonstrated that these assertions were false (ftp://gatekeeper.dec.com/pub/DEC/WRL/research-reports/WRL-TR-88.4.ps), and there is a good analysis in *Practical Planning for Network Growth* by John Blommers.

Even if some of the claims were true, they only affect Ethernet at quite high loads. Do you really want to be running your LANs at sustained high loads?

Since traffic on data networks is by nature bursty (see ftp://thumper.bellcore.com/pub/dvw/sigcomm93.ps.Z), the only way to get sustained high utilization is to be spreading out the burstiness by buffering in the interconnect devices.

Of course, such buffering will result in increased packet latencies — hardly a design goal in most networks. If your LANs are that busy, divide them up with routers or switches. There are many token-ring networks in the world, and token ring is not about to go away soon. But it is my experience that in most existing large token-ring networks, parallel Ethernet networks are being constructed — mostly for cost and availability reasons.

Scott Bradner

Token ring still costs quite a bit more than Ethernet, and while many new PCs come with Ethernet built in, token ring is almost always an extra cost add-in.

Fast Token Ring is being touted as a backbone for token-ring LANs, but this is not that necessary since many are moving wholesale to Ethernet.

There is, however, a clear reason that it is not a good idea to use Ethernet (fast or gigabit) as a backbone for token-ring LANs. Token rings can support much larger packets than Ethernet can, and these larger packets cannot be transported across an Ethernet backbone without extra work and in the case of non-IP protocols, not at all.

In a way we have had Fast Token Ring for quite a while — it is called FDDI. It is a token-based network technology that runs at 100M bit/sec and supports large packet sizes. Many current token-ring networks already use FDDI backbones.

Far be it for me to discourage the development of any useful technology. But I do wonder just how much Fast Token Ring will add to the networking tableau. I will say that it is not something I would advise a venture capitalist to put much money into.

Disclaimer: Harvard has a couple of token-ring LANs (gifts of IBM) but is mostly Ethernet, so the above are my own frustrations.

Bradner is a consultant with Harvard University's University Information Systems. He can be reached via e-mail at sob@harvard.edu.

TELECOMMUTING & Home Office
EXPOSITION & CONFERENCE

October 15–17, 1997
Moscone Convention Center
San Francisco, CA

Corporate Solutions Through Remote Access

Virtual Offices... Remote Business Locations... Work-at-Home Employees... they're all part of a movement that's reshaping the American workplace. By the year 2000, this shift of the workforce will be 55 million workers strong.

Productivity-enhancing technology

Telecommuting & Home Office Exposition & Conference offers you the solutions, strategies and products to make this monumental shift possible. You'll see:

- remote access technology
- networking & telecommunications equipment
- internet access providers
- computer hardware & software
- products & services for remote offices
- financial, legal, insurance & management consulting services

An educational, business-to-business environment

If you're an executive or network manager or facilities manager charged with telecommuting your department, or a current telecommuter or home office worker, Telecommuting & Home Office Exposition & Conference is a must-attend event for you! The conference provides pragmatic tips on costs vs. benefits of telecommuting, technology trends, human resource issues, and more. Corporate case studies and insights from successful home-based workers round out the program.

Sponsored by:
Flagship Sponsor NetworkWorld
PC WORLD
Macworld
IDC/LINK
Forbes
Forbes ASAP
FAST COMPANY
Mobile Office Vehicles
Mobile Office Association, Inc
Steelcase
Vendors' ISDN Association

For more information, call 800-393-THOE
See THOE on the WWW: http://www.mhe.com/thoe/

TELECOMMUTING & HOME OFFICE
EXPOSITION & CONFERENCE
owned by: IDG WORLD EXPO
managed by: MHA EVENT MANAGEMENT

Send more information on Telecommuting & Home Office Exposition & Conference!
I am interested in: ☐ Attending ☐ Exhibiting
NWW
Name ____________
Company ____________
Address ____________
City/State/Zip ____________
Phone ____________ Fax ____________
email ____________
Mail to: MHA Event Management, 1400 Providence Highway, P.O. Box 9127, Norwood, MA 02062. Or Fax to: 617-440-0357
THIS IS NOT A REGISTRATION FORM.

What if you could make your road to ATM significantly smoother

The road between Frame Relay and ATM can be rough. It can also be nearly impassable, because many network components still make you choose between the two leading standards. With the Alcatel 1100 HSS® multiservice WAN switch from Alcatel Data Networks, you can support either Frame Relay, ATM or both protocols simultaneously in one flexible platform. With standards-compliant and carrier-class features that let you maintain full interoperability with yesterday's systems, while paving the way to tomorrow's. Smoothly. To learn more, call **1-888-ADN-2500** or (703) 724-2878, or visit http://www.adn.alcatel.com.

• FRAME RELAY TO ATM • CARRIER STRENGTH

ALCATEL
TELECOM

Circle Reader Service **#8**

DIGEX™

www.digex.net

We take the Internet personally.℠

Complex Web Site Management

Business Internet Connectivity

USGA

Client:
United States Golf Association (www.usga.org)
At the 1997 U.S. Open, record crowds were expected—on the golf course and on the Internet. The USGA anticipated several million visitors to their U.S. Open Web site (www.usopen.com), so they chose DIGEX for Internet connectivity.

Team:
Stafford, Shawn, Olga and Steve knew usopen.com needed a dependable, high-speed connection. Our network is 99.99% reliable and fully redundant, but that didn't stop us from checking and double checking everything. And we ping all of our routers every 90 seconds, so we knew that if a challenge occurred, we could diagnose the situation before it became a problem.

The Result:
All of the attention we put into our network paid off. The Open sold out in record time, but even without tickets, fans from around the world could follow all the action online, thanks to usopen.com and DIGEX Internet connectivity. To learn more about our comprehensive Business Internet Connectivity and Complex Web Site Management services, call DIGEX today at 1-800-97-DIGEX, or visit www.digex.net.

DIGEX driven℠

1-800-97-DIGEX

© 1997, DIGEX, incorporated, a subsidiary of Intermedia Communications, Incorporated.

Circle Reader Service **#23**

NUTTER'S NETWORK HELP DESK

Ron Nutter, a Master Certified Novell Engineer and Groupware CNE in the Lexington, Ky., area, tracks down the answers to your questions. Call (800) 622-1108, Ext. 476, or send your questions to rnutter@world.std.com.

I'm having trouble setting up Excel 95 to run from the NetWare 4.1 server. I'm able to run Excel from each workstation but cannot get the spell checker to work. I get this error message: "Cannot find ms**.dll in c:\Program Files\Common Files\Office\Proof." Do you have any ideas?**

Via the Internet

Use the Network option and perform an administrative install when installing any Office 95 or 97 programs you want to run as a shared copy from a NetWare server. This places all the files needed for the programs on the server. By default, it also will create the MSApps directory below the MSOffice directory.

You'll need to have a minimum of Read and File Scan rights assigned to the MSApps directory. You should be able to use the same drive letter to reach the MSApps directory as long as it hasn't been map rooted to a directory lower in the file structure. Alternatively, you could map a separate drive letter to the directories that need to be shared or use the universal naming convention of putting a path to the directory you need — for example, \\server—name\volume\directory.

Before starting the install, you'll have to decide whether you want to be able to save the file names in the same long format that is possible when saving to a workstation local hard drive. For NetWare 4.1, this involves using the os2.nam file to apply a name space Windows 95 can use.

After you complete the administrative install, you'll need to do a workstation install to copy the necessary files to the Windows directory on the PCs on which you want to run the MS program.

Choose this option carefully because you may end up installing the entire program on the hard drive instead of just the minimum files needed to run the program from the server.

Cutting the cord with the wireless LAN standard

By Angela Champness

Finalized on June 26, the IEEE 802.11 standard for wireless LANs promises to be a meaningful stepping stone in the evolutionary development and market success of wireless network technologies.

Wireless LAN manufacturers are busy working on 802.11 compliance. Because the standard provides for a range of features and options, future products most likely will be introduced in stages. This means users should demand that wireless LAN products offer a direct migration path to the standard and subsequent standard-compliant products as they become available.

The new standard specifies a choice of three different physical layers. Members of the 802.11 working group decided that a choice of physical-layer implementations was necessary so systems designers and integrators could choose a technology that matches the price, performance and operations profile of a specific application.

The standard provides for an optical-based physical-layer implementation that uses infrared light to transmit data. It also provides two radio frequency (RF) based physical-layer choices: Direct Sequence Spread Spectrum (DSSS) and Frequency Hopping Spread Spectrum (FHSS).

In 802.11, DSSS specifies a 2M bit/sec peak data rate with optional fallback to 1M bit/sec in very noisy environments. The standard defines the FHSS implementation to operate at 1M bit/sec and allows for optional 2M bit/sec operation in very clean environments. The IEEE 802.11 standard specifies that wireless LANs operate in the 2.4-GHz band that regulatory agencies worldwide have set aside for spread spectrum usage.

The 802.11 media access control (MAC) can work seamlessly with standard Ethernet via a bridge to ensure that wireless and wired nodes on an enterprise LAN are logistically indistinguishable and can interoperate. The 802.11 MAC is necessarily different from the wired Ethernet MAC, but any such differences are masked by an access point that connects a wireless LAN channel to a LAN backbone.

The wireless LAN standard uses a carrier sense multiple access with collision-avoidance MAC scheme, whereas standard Ethernet uses a collision-detection scheme.

The roaming provisions built into 802.11 also provide several advantages. The 802.11 standard includes mechanisms to allow a client to roam among multiple access points that can operate on the same or separate channels.

UP CLOSE

The IEEE 802.11 group has finalized the wireless LAN standard

Considered by most experts as critical to the future of wireless networks, the standard will help synchronize the industry. Ultimately, 802.11 means users can mix and match multivendor products. Standardization also can lead to lower cost components, which should translate into lower overall costs for users.

The key components of the finalized 802.11 standard are:

- An optical-based physical-layer implementation that uses infrared light to transmit data
- A 2M bit/sec peak data rate with optional fallback to 1M bit/sec in very noisy environments
- 802.11-compliant devices that work seamlessly with standard Ethernet LANs
- Wireless and wired nodes on an Ethernet LAN that are logistically indistinguishable and can interoperate with each other
- The ability for a wireless device to roam to another connection point if that point is built or provided by the originating vendor

For example, every 100 msecs, the Lucent Technologies, Inc. access point transmits a beacon signal that includes a time stamp for client synchronization, a traffic indication map and indication of supported data rates. Roaming clients use the beacon to gauge the strength of their existing connection to an access point. If the connection is judged weak, the roaming station can attempt to associate itself with a new access point.

The 802.11 standard addresses roaming, provided that all access points in an installation were manufactured by the same vendor. The standard does not ensure that clients can roam among access points from different vendors. With the advent of 802.11 products, customers may want to mix and match access points. For example, some customers will need standard commercial-grade bridges in the office and ruggedized bridges for the factory floor.

To address multivendor roaming, Aironet Corp., Digital Ocean, Inc. and Lucent have collaborated to develop the Inter Access Point Protocol (IAPP) specification. IAPP will extend the 802.11 multivendor interoperability benefits with comprehensive roaming protocols. Several others, including IBM, have voiced support for IAPP as a necessary step toward true multivendor interoperability.

The 802.11 specification adds features to the MAC that can maximize battery life in portable clients via power-management schemes. Power management causes problems with wireless LAN systems because typical power-management schemes place a system in sleep mode (low or no power) when no activity occurs for some specific or user-definable time period. Unfortunately, a sleeping system can miss critical data transmissions. To support clients that periodically enter sleep mode, the 802.11 specifies that access points include buffers to queue messages.

One final area of differentiation between 802.11 and either wired LANs or existing wireless LAN implementations centers on data security. The standard defines a mechanism through which the wireless LANs can achieve Wired Equivalent Privacy (WEP). The optional WEP mechanism is especially important because RF transmissions — even spread-spectrum transmissions — can be intercepted more easily than wired transmissions.

The next step in the evolution of 802.11 most likely is a standard for higher data rates, expected in the 10M bit/sec and above range in the 5.2-GHz band. In the last IEEE meeting, a project authorization request was approved by 802.11 to look into a higher speed standard. As in the wired world, higher speeds are continuously desired for applications such as streaming video, telephony and multimedia. Moreover, faster peak rates will allow more nodes to effectively connect to a wireless LAN via a single channel.

Overall, the 802.11 standard is a robust and rich seven-year effort created by many of the leading scientists in the wireless LAN field.

The flexibility also exists to move products forward in speed and features as they become available without compromising standards compliance. In the meantime, users requiring the flexibility and mobility of wireless LANs would be best served by implementing current technology that offers a clear migration path to the future.

Champness is the director of product and business development for Lucent Technologies' WaveLAN wireless LAN group.

Need information?

Let *Network World* provide a quick primer on an important or emerging technology. If you have an idea for Technology Update, contact Michael Cooney by phone at (508) 875-6400 or e-mail at michael_cooney@nww.com.

EDITORIAL insights

Police the 'Net, don't regulate it

If you think you've heard the last about free speech on the Internet, think again. Although the Supreme Court knocked down the Communications Decency Act, the discussion about controversial Internet content won't end there, nor should it.

The next battle will be over technologies that vendors are proposing (at the urging of the White House) to regulate access to off-color online material.

Central to most of these schemes is the idea of coming up with a system for rating the offensiveness of content. That way users and service providers — such as search engine operators — can block access to things deemed unacceptable. Legislation would be proposed that would make it illegal to misrate content.

As defined to date, the rating stuff is malarkey. The American Civil Liberties Union correctly points out that it would require you to rate your own speech, which is patently ridiculous. In that scenario, if you want to post something on the 'Net, make sure you rate it correctly or risk going to jail. Check out the ACLU's white paper, *Fahrenheit 451.2: Is Cyberspace Burning?*, at www.aclu.org.

There is no question, however, that there is more to be discussed about Internet content, simply because there is so much disturbing material out there.

Disregard the standard-issue sexual stuff. Whether it's your cup of tea or not, it's legal. But then there is the illegal. Web sites boasting pictures of teens or preteens naked or having sex. Web sites peddling movies (with short animated previews) of bound women getting ice picks shoved through their breasts. And sites with pictures of people having sex with animals.

These are complemented by newsgroups such as alt.sex.pedophilia, alt.sex.incest and alt.sex.bestiality. (Ironically, those using the Internet to peddle sex for profit are actually choking off much of the deviant newsgroups by overrunning them with ads for Web sites.)

No wonder even liberal-minded people that have roamed the 'Net come away thinking something needs to be done. After all, freedom of speech is a relative thing. As a society, we have determined what is beyond the pale and have created laws to deal with the offensive. Those same laws apply to online material.

So the answer, then, is not to try to "fix" the Internet by establishing more regulation or calling for self-imposed ratings. The answer is to step up enforcement of existing laws.

But, the simple fact of the matter is that traditional law enforcement is having a tough time moving at cyberspeed. Perhaps the White House would have better luck battling this beast by pouring additional funding into organizations whose job it is to police the 'Net.

John Dix, editor jdix@nww.com

The Internet • Wayne Spivak

Doing the math to resolve the NT vs. Unix debate

Let's pretend your business is in a section of your state where the big Internet service providers currently do not — and may never — have a local point of presence. So you decide to start a small, local ISP. Your budget is nonexistent, therefore your goal is to do it on the cheap.

During the planning process, you face the question of which operating system to use: Windows NT or a flavor of Unix?

Assuming you're neither a Unix guru nor an NT wizard and you've never set up a Unix or NT server, this can be a confusing question. I decided to test how long and how much money it would take to set up a server that could handle Domain Name System (DNS), Web services and e-mail — the three must-haves for customers.

I set up a Windows NT 4.0 server. On another box I ran three different Unix flavors — Red Hat Linux 4.0, Slackware Linux and Berkeley Software Design, Inc. (BSDI) Unix 3.0. Because I had never done this before, it took me the better part of three days to set up each operating system. Normally, it should take anywhere from four to eight hours.

NT and Unix servers take about the same amount of time to get up and running. Now let's look at the bottom line: What do these machines cost?

An NT server with five clients costs $809. The e-mail server I chose, Seattle Labs' SLMailNT, costs $425.

Red Hat and Slackware are Linux products that can be downloaded free off the Internet. They're also available on CD-ROM for a nominal charge.

BSDI Unix costs $995 and includes a 16-user license, good for 160 simultaneous Web connections. Remember, this is my business, so I'm interested in not only the cost of the software, but support as well.

Direct Microsoft NT support costs $195 and up per incident, which I guess I should be willing to pay.

All BSDI customers receive free upgrades and full telephone support for 60 days after BSDI ships their product. Telephone installation support continues, as needed, after the initial 60 days.

Red Hat and Slackware are, for the most part, freeware, so almost all support is through newsgroups and mailing lists — not the greatest for mission-critical systems. Red Hat does offer 30 days of free installation technical support by fax or e-mail when you purchase a valid copy. Slackware support is harder to find, but there is tons of user-to-user help available from sources such as Usenet, mailing lists and the World Wide Web.

Now what are my hardware costs? Let's assume I already own the required 4G-byte drive, SVGA monitor, keyboard, mouse and tower case, with a 12X CD-ROM and 3.5-inch floppy.

For the NT system, I need at least a Pentium — ideally, a Pentium Pro. Memory requirements are a minimum of 128M bytes. This configuration will set me back an additional $1,000.

For the Unix system, I can use a 486 DX2-66 chip and motherboard with only 16M bytes of RAM. This configuration costs about $268. At that price, I can purchase four of these 486 motherboard systems for slightly more than the cost of one NT setup.

So after all this work installing, configuring and playing with each operating system, which is it, NT or Unix? Hands down, I'd go for a flavor of Unix. It's cheaper to purchase and support, the hardware costs are lower and if you're not in need of database hooks, it really is ideal.

To be more specific, for the ISP described, I'd go with a broadly supported Unix flavor that has technical support and a research and development department, such as BSDI Unix.

If you're looking at putting up a Web site for that intra-inter-extranet, even without a limited budget, consider using Unix for at least the pilot project. With few exceptions, everything is transferable from Unix to an NT server.

*Spivak is president and owner of SBA * Consulting, an IT consulting firm, and SBA.NET.WEB, an Internet consulting company. He can be reached via the Internet at wspivak@sbanetweb.com.*

MESSAGE QUEUE

Send letters to nwnews@nww.com or John Gallant, editor in chief, Network World, *161 Worcester Road, Framingham, MA 01701. Please include phone number and address for verification.*

A better Outlook

In your review "'Net picks and pans" (July 28, page 53), you state: "Microsoft's Outlook suffers from a horrible interface..." Your article suffers from horrible hyperbole; every one of my Outlook users loves Outlook. It's not perfect, but its integrated nature is superior to other e-mail clients we have tested on actual users, whose approval is what matters.

The review also states Outlook "tries to do many things in addition to messaging but does none of them well." This statement is so vague as to be meaningless. What "things" in particular? Why were they judged to be below par?

Maybe you should print longer reviews

Above the Cloud • *James Kobielus*

Netscape is an enterprise groupware contender

Are you prepared to consider Netscape a serious contender in the groupware market, alongside Lotus, Microsoft and Novell? You should be.

With its recent releases of Communicator 4.0 and SuiteSpot 3.0, Netscape has elevated itself into the groupware market with a strong, integrated product line. If Netscape fails to penetrate this market in a big way, it will be due more to failure to position itself in users' minds as an alternative to Domino, Exchange and GroupWise than as a result of any shortcomings in its products.

Netscape's standards-oriented product architecture makes its Web-based groupware offerings competitive from a cost-of-ownership and enterprise-scalability standpoint. However, enterprise users still tend to view Netscape as a purveyor solely of HTML/HTTP-based Web browsers and servers.

The company's reliance on purely Web-based solutions has become less of a limitation as most of the corporate world rolls out intranets based on HTTP and TCP/IP. Every groupware vendor has placed the highest priority on adapting its environments to be accessed from browsers and to hook into HTML-based file stores.

From a feature standpoint, Netscape's offerings are fast approaching parity with the leading groupware environments. This is not to deny that Domino, for example, may outshine SuiteSpot in some replication, administration or development features. Or that Microsoft can eke some browser or messaging performance and functionality advantages from its control over ubiquitous desktop and server operating environments.

However, Netscape, with its cross-platform, multimedia-rich, Java-oriented product architecture, will hold its own by giving users what they need most: a cost-effective, rigorously standardized, cross-platform computing and collaboration environment.

Where performance is concerned, Netscape's products can scale up easily to enterprise workloads. The company claims that its SuiteSpot servers can support up to 1 million Web/HTTP hits per day, per server; 300,000 queries per hour against the directory server; 100,000 queries per day against the search engine; and 300,000 requests per day per proxy server, with the ability to manage caches of up to 128G bytes and 70 million URLs per proxy. Obviously, you will need to check out these claims in your own environment, but they are not far off from performance statistics that have been reported by independent testing organizations.

In terms of flexibility, Netscape's Internet standards-based technical approach allows users to mix and match the company's client, server and development products with those of competitors and other third parties. All Netscape products can be set up, configured, monitored and administered remotely from any Secure Sockets Layer/JavaScript-enabled browser, which should help to streamline support costs and speed response to trouble calls and security events.

Netscape's management appears to understand enterprise users' critical need for support and is ramping up its service force and relationships with third-party integrators. The company recently announced it derives approximately one-third of its revenue from service contracts, equaling the amount it takes in from browser and server software licenses, respectively. As Netscape's client, server and development products compete in an increasingly commoditized marketplace, the comny's profitability increasingly will rely on providing value-added consulting and systems integration services to enterprise customers.

From a cost-of-ownership standpoint, Netscape's already competitive software licensing fees look even more attractive over the life cycle. You can standardize on Netscape as a provider of point products for particular requirements — browsers, messaging or directory services — or integrated solutions without having to lock in to a proprietary architecture.

It also means that Netscape always will feel driven to bring best-of-breed products — either in-house or third party — into its product mix to earn your continuing loyalty. You will be able to satisfy requirements with the widest range of competing client, server, application development, application suite and information services products, confident that it will all play across the Netscape enterprise environment.

Nevertheless, committing to Netscape's groupware offerings also carries considerable risks. The company is new to the enterprise arena, offers no radically superior groupware/messaging products and is vulnerable to Microsoft, Lotus and Novell's entrenched positions in the desktop, messaging and network operating system arenas, respectively.

It would be premature to standardize on Netscape beyond simple Web browser and server products for at least another year or another round of groupware product releases.

Next year, when the company rolls out the latest versions of its client and server products, code-named Mercury and Apollo, we will see whether Netscape is truly committed to staying competitive in the enterprise groupware market.

Kobielus, a contributing editor to Network World, *is a senior telecommunications analyst with LCC International, Inc., a McLean, Va.-based network design, engineering and integration firm. He also is coauthor of an upcoming Rapport Communication report on Netscape's intranet and groupware products and directions. To order the report, contact Rapport at (513) 777-4529.*

---

if you have extensive problems with a product. Printing a short approval is acceptable, but a short disapproval does the reader, who relies on your publication for purchasing advice, a disservice.

Tell us specifically what problems you have with an interface or product. Don't engage in frothing at the mouth just because it's fashionable to dislike Microsoft — whose products, like it or not, perform acceptably for many of us in the real world.

Patrick El-Azem
Boston

Test Center Director Lee Schlesinger replies: Since we looked at Microsoft Outlook for the review, the company has delivered two important extensions (www.microsoft.com/officefreestuff/outlook/default.htm). With the addition of the Internet Mail Enhancement Patch and the Three-Pane Extension, Outlook is a much better messaging client. However, while improved, it isn't "best of breed" as a mail client, personal information manager or group calendaring application.

Advice for IBM

Regarding your article "IBM adds zing to Token Ring" (July 28, page 1):

At the token-ring summit several weeks ago, IBM did not say much. Now IBM is expected to announce a suite of 100M and 128M bit/sec token-ring products.

If IBM wants to lead the Fast Token Ring (FTR) market (3Com and Bay Networks may follow soon), it needs to do three things.

First, IBM must offer these products at a low cost — not more than 10% higher than that of Fast Ethernet. Second, IBM must offer FTR token interface cards for the 37xx product line. Finally, IBM must work with server vendors to offer FTR network interface cards. Even then, FTR will not help increase token-ring market share — it'll be a solution for some large existing token-ring users.

This is not a war of technologies (Ethernet vs. token ring); it is a quest to reduce the total cost of ownership in the client/server environment — and users must win.

Peter Alissandratos
Vice president, network engineering
Bank Of New York
New York

To market, to market

Mark Gibbs' column "Blue shorts, red shorts: Betting on directory services" (July 21, page 65) was right on the money. I, too, believe Novell Directory Services is superior to Microsoft's options. However, technical superiority does not a winner make.

Novell needs to put its marketing folks to work. As a certified Novell engineer, I am constantly aware of any media attention bestowed upon Novell, and I have to say that Microsoft wins that race.

Mind share, combined with a superior product, will determine the winner.

Michael Lyons
Network administrator
Township of Morris, N.J.

Teletoons

Oh, sure, I'm technologically savvy, but it's really my project management skills that got me where I am today!
Phil Frank

Phil Frank and Joe Trois baba@sfgate.com

New grads

Continued from page 1

And folks, we got an earful. We heard of companies desperate to fill positions waving money in front of ill-equipped recruits to sign up fast. Interviewers asking technology questions way beyond their own realm of comprehension. Executives too busy critiquing candidates' attire to probe deep enough to understand prospective employees' skill sets. The list is long.

The upshot is that some top graduates are becoming disenchanted with the process and are taking a hard look at how they'll fit into organizations that take a cookie-cutter approach to interviews.

Krall, for instance, began his job search interviewing with companies on both coasts. But when he made up his mind to return home to California, he narrowed his search. In doing so, he was forced to adjust his tactics. West Coast companies, Krall says, hunt for employees to fill an immediate need, while East Coast companies hire to fill positions that will not be available for six months or more.

"I was going to have to wait for April or May to search," Krall says, noting that as soon as he cast out resumes last fall and again in January, he was getting bites to interview for immediate vacancies. Krall only interviewed with Quantum this past June.

Krall fielded about a half-dozen serious offers. He weeded them out based on his impressions of the organization, how it treated employees and what impact he would make at the company. "I was interested in how they react to you as an individual and how they think you'd fit into their team," Krall says. "I wanted the employer to show me I belonged there."

According to Krall, too often companies float offers in an offhanded manner, convinced a prospect will snatch the opportunity to work with the company. "They assume because of the money or the [corporate] name, you're going to take it," Krall says.

There are other factors that turn off recruits from potential employers. When Krall jetted out to San Diego last spring to meet with executives from an electronics employer about a prospective IS position, the company impressed him with lavish hotel accommodations and a rental car.

But after sitting down with a string of company managers, Krall's opinion of the company plummeted, leaving him with a sour taste.

World Fusion
Check out Fusion for more tips on hiring high-tech workers.
FIND IT ON FUSION
3411

"I witnessed a political nightmare you wouldn't believe," says Krall, who finished first in his MIS class. Every person that interviewed the hot MIS recruit either warned him about the next interviewer or confided his personal distaste for previous managers he had met.

"I'm thinking, 'If you're trying to get me to work here, don't tell me how bad everyone is,'" Krall says. "Everyone knows company politics happen, but to show it to prospective recruits is a different story."

Marc Catalano's *internship at John Hancock was instrumental in landing a job as senior PC/LAN analyst.*

SHAWN HENRY

Krall also interviewed at Sun Microsystems, Inc. for a Java applications programmer position. He met for 15 minutes each with two representatives, explained he wasn't a standard Java developer but a Web developer with some Java skills and left thinking there was no way Sun would call him back.

"The next morning, I had an offer before I even woke up," Krall says, adding it was substantially higher than other offers he fielded. The experience left him jaded. The money was tempting, but it made him think, "Is this the way they respond to situations?" The idea of bringing in recruits with skills that don't line up with the company's needs left Krall debating the strategy of having to train high-paid recruits. Companies should be more selective about who they hire, and they should ensure that a job candidate's skill set and personal goals mesh with company needs, Krall says.

"Save your money and go after people who are good at what they do," Krall says. "Make sure students have the skills they advertise on their resumes — dig a little deeper and see if they really know their stuff."

Krall worries about his peers' desire to land a job with an established, cash-rich company. He says it's disappointing to watch employers prey on the naive attitude of graduates who are often worried about job security and anxious to land a position with a stable employer. "A lot of employers use that to their advantage and put offers on the table in a take-it-or-leave-it fashion," Krall says. Moreover, they recruit almost a year before students graduate, often at a time when many haven't yet taken their bread-and-butter IS classes.

More important, Krall says, companies should let top recruits know they're needed. "I want the assurance that when I go in there, I'm going to make a difference in the company," Krall says. "I'm not just another cog in the wheel."

The long view

Catalano took a slightly different approach to weeding out prospective employers based on a mix of priorities. Tops on his list were the benefits and educational incentives the companies pitched. "If they weren't willing to pay for an MBA and for my certifications, I knocked them out of the running," he says. Salary plus bonuses weighed in as his second criteria, and job responsibilities placed third.

Catalano paid particular attention to where the company saw him going in five years and what types of career paths he could follow once on board.

He also searched for an employer with deep pockets — one with a healthy IS budget and a commitment to upgrading its network infrastructure. What made potential employers stand apart was their technology direction, Catalano says. He paid attention to the shape of their networks at present and what company plans called for five years down the road.

At a meeting with Liberty Mutual Group executives in New Hampshire, Catalano asked an executive about the scores of older Macintoshes that abounded. He was told the company planned to transition to Microsoft Corp.'s NT Server within three years.

"I'm thinking, you're going to convert all your systems to NT, roll out Win95 desktops to all users in three years and you haven't started yet? It just didn't jibe," he says.

Catalano says he shopped for an employer that embraced technology change — moving from NetWare to NT Server, rolling out TCP/IP, "just getting with the times."

"I wanted to be challenged," Catalano says, adding that a month after he started as an intern at John Hancock, he found himself pulling apart and upgrading critical departmental servers. "I was shocked," he recalls. "In my view, I wasn't qualified, but it was learn as you go."

Both students hunted for managers that were technology savvy, not just administrators capable of managing hordes of people. Krall sought a team-oriented individual who is open to ideas and mingles with workers outside the office.

On a recent Friday, Krall and his coworkers took a whitewater rafting diversion from work. "We're often there 10 to 11 hours a day. It's important to have a leader who can relate," he says.

Both new grads also have definite suggestions about improving the recruitment process. Krall bristles when talking about companies that portray a mentality that they're doing you a favor by hiring you.

"I wanted people to say, 'We know you're good, we know you can fit in here. Come on in and help us,'" Krall says. "What I often got was, 'You think you're good at what you do. We're gonna change that, and we're not going to pay you much.'"

He advocates that recruiters test prospective employees on the depth of their knowledge.

Catalano, meanwhile, emphasizes the importance of internship programs for junior and senior MIS students. That's because he interned first at Hancock, came on board as a part-timer his senior year and upon graduation landed a full-time position. "The internship gave me a chance to understand the politics and gain a solid understanding of the technology and where things are going," Catalano says. "It gave Hancock an advantage [in landing me]."

Internships certainly are appealing as a means to get in the door. But according to Krall salary often is a major factor for students just leaving school. He believes employers should be more judicious about how they wave money around.

"Don't think because you can throw salaries around, people are going to take the jobs," Krall says. "You're going to kill a lot of people that way. They'll never last very long in your company if money is the motivating factor. They have to learn to do what they enjoy." ■

IT staff shortage has changed the rules of the hiring game

Here's five rules to follow to get the best people.

By Alan Radding

Are you prepared for all-out warfare? You have to move fast. Launch lightning raids. Chase every lead. Jump instantly on every opportunity. Think creatively. Be aggressive. Take risks. Of course, you better have deep, deep pockets if you intend to win.

In today's superheated market for technical talent, discussions about hiring practices almost sound like they're about business survival on Wall Street.

If you want to fill those high-tech job openings with the best and brightest candidates available, you need to realize that the traditional corporate hiring process is as outdated as the acoustic coupler. The huge demand for IT workers means you should learn five new rules to excel at the game.

"The traditional hiring process simply is not working," says Martin Harts, a partner in the compensation practice at KPMG Peat Marwick LLP in Toronto. And it's not working for one big reason: Demand for technical people outweighs supply by 20 to 1, reports Bennett Carroccio, president of Otec, Inc., a New York-based recruitment firm. Carroccio has 20 immediate openings for each skilled candidate.

"The competition for people has become one of the key aspects of competition between companies," says Bill Cadogan, president and CEO of ADC Telecommunications, Inc. in Minneapolis. The company with the best people wins, especially when it comes to networking and communications — two critical strategic enablers.

Having surpassed $1 billion in sales and still growing at 40% a year, ADC has been aggressively recruiting technical telecom talent, hiring more than 1,000 people in the past year. The company is pulling out all the stops to get the people it needs to sustain its growth. ADC is paying more and expanding its use of headhunters.

It has even relocated an entire business unit — the network services group — to Texas, where it hopes to take advantage of the larger pool of people with network skills in the Dallas/Richardson telecom corridor.

Businesses such as ADC have found that while there's not much they can do to change the market, there are several smart hiring strategies they can adopt to weather the drought.

Rule 1: Contact prospects immediately

No candidate with reasonable networking or telecommunications skills needs to wait around for weeks, and you can bet they won't. "With anything beyond 10 days, you are taking a big chance," says Ron May, president of Specific Recruiting, a Chicago-based recruitment firm that specializes in

Boise Cascade Office Products' Bob Walsh *says a resumé only has a four- to five-day shelf life.*

DAVID JOEL

technical positions.

This has been the experience for Boise Cascade Office Products, the second-largest provider of office supplies in the world. The company has set its sights on becoming No. 1 but can't accomplish that goal without bringing in more people. Despite nearly continuous hiring, Bob Walsh, systems and programming manager at the Itasca, Ill.-based company, is still shocked by the changes he sees in the market for technical people. "The life expectancy of a resumé has gone from six to nine weeks a couple of years ago to four to five days or less now," he observes.

In some markets, candidates with the skills in highest demand — say, network architects, Cisco router technicians and MCSE-certified Windows NT administrators — can actually walk out of a job fair with one or more job offers in their pockets. In response, "we've had to shorten our interviewing process so we can schedule interviews within a day or two," Walsh says. This puts great strain on the hiring managers who also have their normal work to do, but it has become a necessity.

Rule 2: Expand your recruitment efforts

It's not enough anymore to rely on placing an ad in the Sunday edition of the local newspaper; it reaches only a fraction of the pool of potential technical job seekers. Instead, hiring managers are turning to the World Wide Web, job fairs, local colleges, executive recruiters and more. "I'd even consider handing out flyers at the train station," says Walsh, only half-jokingly.

Plenty of businesses have been known to skip this effort and head to fertile hiring ground — their competition. Raiding occurs when a company sets out to target and steal away a technical manager with a large network of people, says Adam Kohn, vice president of Christian & Timbers, a headhunting firm in Cleveland.

The new hire naturally brings over people from his or her network, including people from the previous employer. This kind of raiding usually requires a headhunter who provides the confidentiality that's needed to go after people who aren't in the job market.

In another version of raiding, the hiring company picks over the remains of companies that are undergoing some sort of trauma, such as downsizing, restructuring, merging or bankruptcy.

"When we are aware of changes going on at a company, such as the bankruptcy at Montgomery Ward, we'll go after people there," says Ken O'Brien, director of corporate information services for Wallace Computer Services, an integrated supplies management company in Lisle, Ill. However, the business is careful about which companies it stalks. "We don't want to burn any bridges," he says. "Some of these companies are also our customers."

O'Brien pays particular attention to mergers and acquisitions among his competitors, knowing that good people can be shaken free under those circumstances.

Companies also are teaming up with local colleges, the training ground for technical talent. "We give scholarships and offer paid internships. We hire faculty as consultants. Some of our people even teach in classes," O'Brien says. Other companies have increased their use of independent contractors and consultants to meet staffing needs.

Rule 3: Don't rely on human resources

Know that human resources departments may not be up to the task of evaluating sophisticated technical skills, even for preliminary screening. If the HR department is slowing down the process, it needs to back off and let the hiring managers deal directly with candidates. HR's new role is to remove obstacles such as rigid hiring, benefits and compensation policies and be creative in coming up with solutions.

"We want HR to open up new ways to the market, to come up with strategies that help solve the problem," says ADC's Cadogan.

Rule 4: Decide quickly

Nobody with hot skills is likely to hang around for three or four interviews. Get all your interviewing and testing done in two sessions, max.

Wallace Computer Services not only shortened its hiring cycle, but also stays "in contact with a job candidate almost every day," O'Brien says. Even such close contact, however, doesn't ensure success. "We've had candidates decide to go elsewhere right in the middle of our hiring process," he says. They couldn't or wouldn't wait.

But shortening the hiring time frame is a double-edged sword. A faster process enables the organization to grab highly sought people before they get away, but it increases the risk of making a bad decision. It also puts a lot of pressure on hiring managers.

"It is a lot to ask a manager to sit at a job fair for half a day in the hope of hiring someone on the spot," says Walsh. He has reduced the hiring process to a couple of interviews, which can be conducted within two days of receiving a resume.

Although Choate Rosemary Hall, a prestigious private school in Wallingford, Conn., has sped the hiring process in its search for technical workers, it refuses to truncate its process to the extent that it risks making a bad decision.

"We still go through the full set of interviews. We don't want just a technology hotshot. We want someone who can fit in and work in a team atmosphere," says Zmara Knoll, the school's operations manager of information technology services.

Rule 5: Be ready to pay big bucks

Forget about salary negotiation — it's a seller's market. Know what the market is for the candi-

New generation of high-tech hotshots bring a sea change in attitude

Many hiring managers will have to come to terms with the new attitude toward companies and careers among the latest generation of technical recruits. To put it bluntly, younger candidates generally aren't willing to patiently pay their dues, follow the rules and play the traditional career game.

"These kids are very bright with computers, but they are demanding and often one-dimensional," says Bob Walsh, systems and programming manager at Boise Cascade Office Products in Itasca, Ill. They only want to work on the best projects, use the latest technology and do things their way. Still, with demand so high, Walsh has to put aside his personal judgments.

To Walsh's chagrin, his son, a Windows NT specialist with three years' experience, spurned a $5,000 raise by telling the supervisor to "get real" and that it didn't come close to the market. Yet this is the attitude hiring managers everywhere are finding among young people with skills in high demand.

"We're seeing what is truly a different generation. These people have a different attitude toward work and what they value," says Glenn James, a partner in the telecommunications and media practice at Deloitte & Touche Consulting Group in Atlanta. Companies that can accommodate that attitude, however, can cultivate a top-notch technical resource. Younger professionals work hard, but want to do it their way. And they play hard, often mixing the two.

For example, Interworld Technology Ventures, Inc., a young New York-based Internet company, has hired more than 120 people with Internet skills in the past two years. "We have a billiards room that people can use. We give people the best machines, and they get to work on the most exciting stuff going on," boasts Todd Zangrillo, vice president of human resources. It is a high-intensity, demanding, opportunity-rich, unstructured environment in which people are invited to take charge of their project and run with it — the sort of place that appeals to today's twenty-something Internet hotshots.

By comparison, Bard White, chief information officer and worldwide director at Spalding Sports Worldwide, a sporting goods manufacturer in Chicopee, Mass., draws the line at attitude. "When I interview people, I always look at attitude, not their technical skills. I want to know how well they will fit in," he says. Fortunately, while he has openings to fill, his current needs are not critical, so he can afford to be fussy.

— Alan Radding

FREE Product Info

READER SERVICE CARDS

Reader Service Card

NetworkWorld

IT'S EASY. Circle the number on this card which corresponds to the number at the bottom of the advertisement. Mail or FAX to (413) 637-4343 today. Information will be provided to you FREE of charge.

Circle the number below which corresponds to the number at the bottom of the advertisement for more information.

1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18
19	20	21	22	23	24	25	26	27
28	29	30	31	32	33	34	35	36
37	38	39	40	41	42	43	44	45
46	47	48	49	50	51	52	53	54
55	56	57	58	59	60	61	62	63
64	65	66	67	68	69	70	71	72
73	74	75	76	77	78	79	80	81
82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99
100	101	102	103	104	105	106	107	108
109	110	111	112	113	114	115	116	117
118	119	120	121	122	123	124	125	126
127	128	129	130	131	132	133	134	135
136	137	138	139	140	141	142	143	144
145	146	147	148	149	150	151	152	153
154	155	156	157	158	159	160	161	162
163	164	165	166	167	168	169	170	171
172	173	174	175	176	177	178	179	180
181	182	183	184	185	186	187	188	189
190	191	192	193	194	195	196	197	198
199	200	201	202	203	204	205	206	207
208	209	210	211	212	213	214	215	216
217	218	219	220	221	222	223	224	225
226	227	228	229	230	231	232	233	234
235	236	237	238	239	240	241	242	243
244	245	246	247	248	249	250	251	252
253	254	255	256	257	258	259	260	261
262	263	264	265	266	267	268	269	270
271	272	273	274	275	276	277	278	279
280	281	282	283	284	285	286	287	288
289	290	291	292	293	294	295	296	297
298	299	300	301	302	303	304	305	306
307	308	309	310	311	312	313	314	315
316	317	318	319	320	321	322	323	324

Please check all of the products for which you are interested in receiving FREE information.

COMPUTERS/PERIPHERALS
600 ☐ Backup Devices
601 ☐ Cabling and Cabling Systems
602 ☐ Micros/PCs
603 ☐ Mainframes
604 ☐ Minis
605 ☐ Printers
606 ☐ Storage Devices
607 ☐ Terminals
608 ☐ UPS
609 ☐ Workstations

SOFTWARE
610 ☐ Applications
611 ☐ Client/Server Application Development
612 ☐ Communication/Terminal Emulation
613 ☐ Computer Operating Systems
614 ☐ Database Management/RDBMS
615 ☐ E-Mail
616 ☐ Groupware
617 ☐ LAN Operating Systems
618 ☐ Network Diagramming
619 ☐ Network Management
620 ☐ Security
621 ☐ Suites
622 ☐ Systems Management

INTERNETWORKING
623 ☐ Bridges
624 ☐ Routers
625 ☐ Gateways

LOCAL AREA NETWORKS
626 ☐ ATM Switches
627 ☐ Ethernet Switches
659 ☐ Fax Servers
628 ☐ Hubs/Intelligent Hubs
629 ☐ LAN Servers
630 ☐ Local Area Networks
631 ☐ Network Adapter Boards/NICs
632 ☐ Peer-to-Peer LANs
633 ☐ Print Servers
634 ☐ Remote LAN Access
635 ☐ Remote Access/ Communication Servers
660 ☐ Security
636 ☐ SNMP Network Management
661 ☐ Storage
637 ☐ Superservers
638 ☐ Wireless Networks

REMOTE/WIRELESS COMPUTING
639 ☐ Laptops, Notebooks
640 ☐ PCMCIA
641 ☐ Mobile Data Equipment and Services
642 ☐ Wireless Data Equipment and Services

WAN EQUIPMENT AND SERVICES
643 ☐ ATM
644 ☐ CIT (Computer Integrated Telephony)
645 ☐ Diagnostic, Monitoring and Test Equipment
646 ☐ DSU/CSU
647 ☐ E-Mail/On-Line Services
648 ☐ FAX Boards/Modems
649 ☐ Fiber Optics
650 ☐ Frame Relay
651 ☐ ISDN
652 ☐ Modems
653 ☐ PBX
662 ☐ Security
654 ☐ SMDS
655 ☐ T1, T3, Fractional T1 Mux and Services
656 ☐ Videoconferencing/ Teleconferencing
657 ☐ WATS/MTS

INTERNET/ELECTRONIC COMMERCE
658 ☐ Internet Access Providers/Services
659 ☐ Firewalls
660 ☐ Web Servers
661 ☐ Internet Software Tools

OTHER
662 ☐ Education and Training
663 ☐ Storage Cabinets/Furniture

ISSUE DATE 08/18/97

CARD MUST BE RECEIVED BY 11/18/97

NAME

TITLE

COMPANY

STREET

CITY/STATE/ZIP

( )
PHONE

( )
FAX

E-MAIL ADDRESS

FILL OUT, DETACH AND MAIL

Now it's easy to find valuable information on the latest products and services with *Network World's* Reader Service Card – FREE!

FILL OUT, DETACH AND MAIL

Reader Service Card

NetworkWorld

IT'S EASY. Circle the number on this card which corresponds to the number at the bottom of the advertisement. Mail or FAX to (413) 637-4343 today. Information will be provided to you FREE of charge.

Circle the number below which corresponds to the number at the bottom of the advertisement for more information.

1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18
19	20	21	22	23	24	25	26	27
28	29	30	31	32	33	34	35	36
37	38	39	40	41	42	43	44	45
46	47	48	49	50	51	52	53	54
55	56	57	58	59	60	61	62	63
64	65	66	67	68	69	70	71	72
73	74	75	76	77	78	79	80	81
82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99
100	101	102	103	104	105	106	107	108
109	110	111	112	113	114	115	116	117
118	119	120	121	122	123	124	125	126
127	128	129	130	131	132	133	134	135
136	137	138	139	140	141	142	143	144
145	146	147	148	149	150	151	152	153
154	155	156	157	158	159	160	161	162
163	164	165	166	167	168	169	170	171
172	173	174	175	176	177	178	179	180
181	182	183	184	185	186	187	188	189
190	191	192	193	194	195	196	197	198
199	200	201	202	203	204	205	206	207
208	209	210	211	212	213	214	215	216
217	218	219	220	221	222	223	224	225
226	227	228	229	230	231	232	233	234
235	236	237	238	239	240	241	242	243
244	245	246	247	248	249	250	251	252
253	254	255	256	257	258	259	260	261
262	263	264	265	266	267	268	269	270
271	272	273	274	275	276	277	278	279
280	281	282	283	284	285	286	287	288
289	290	291	292	293	294	295	296	297
298	299	300	301	302	303	304	305	306
307	308	309	310	311	312	313	314	315
316	317	318	319	320	321	322	323	324

Please check all of the products for which you are interested in receiving FREE information.

COMPUTERS/PERIPHERALS
600 ☐ Backup Devices
601 ☐ Cabling and Cabling Systems
602 ☐ Micros/PCs
603 ☐ Mainframes
604 ☐ Minis
605 ☐ Printers
606 ☐ Storage Devices
607 ☐ Terminals
608 ☐ UPS
609 ☐ Workstations

SOFTWARE
610 ☐ Applications
611 ☐ Client/Server Application Development
612 ☐ Communication/Terminal Emulation
613 ☐ Computer Operating Systems
614 ☐ Database Management/RDBMS
615 ☐ E-Mail
616 ☐ Groupware
617 ☐ LAN Operating Systems
618 ☐ Network Diagramming
619 ☐ Network Management
620 ☐ Security
621 ☐ Suites
622 ☐ Systems Management

INTERNETWORKING
623 ☐ Bridges
624 ☐ Routers
625 ☐ Gateways

LOCAL AREA NETWORKS
626 ☐ ATM Switches
627 ☐ Ethernet Switches
659 ☐ Fax Servers
628 ☐ Hubs/Intelligent Hubs
629 ☐ LAN Servers
630 ☐ Local Area Networks
631 ☐ Network Adapter Boards/NICs
632 ☐ Peer-to-Peer LANs
633 ☐ Print Servers
634 ☐ Remote LAN Access
635 ☐ Remote Access/ Communication Servers
660 ☐ Security
636 ☐ SNMP Network Management
661 ☐ Storage
637 ☐ Superservers
638 ☐ Wireless Networks

REMOTE/WIRELESS COMPUTING
639 ☐ Laptops, Notebooks
640 ☐ PCMCIA
641 ☐ Mobile Data Equipment and Services
642 ☐ Wireless Data Equipment and Services

WAN EQUIPMENT AND SERVICES
643 ☐ ATM
644 ☐ CIT (Computer Integrated Telephony)
645 ☐ Diagnostic, Monitoring and Test Equipment
646 ☐ DSU/CSU
647 ☐ E-Mail/On-Line Services
648 ☐ FAX Boards/Modems
649 ☐ Fiber Optics
650 ☐ Frame Relay
651 ☐ ISDN
652 ☐ Modems
653 ☐ PBX
662 ☐ Security
654 ☐ SMDS
655 ☐ T1, T3, Fractional T1 Mux and Services
656 ☐ Videoconferencing/ Teleconferencing
657 ☐ WATS/MTS

INTERNET/ELECTRONIC COMMERCE
658 ☐ Internet Access Providers/Services
659 ☐ Firewalls
660 ☐ Web Servers
661 ☐ Internet Software Tools

OTHER
662 ☐ Education and Training
663 ☐ Storage Cabinets/Furniture

ISSUE DATE 08/18/97

CARD MUST BE RECEIVED BY 11/18/97

PASS ALONG

Pass this card along to a colleague so they, too, can get valuable product information FREE.

NAME

TITLE

COMPANY

STREET

CITY/STATE/ZIP

PHONE
( )

FAX
( )

E-MAIL ADDRESS

FREE Product Info

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST-CLASS MAIL PERMIT NO. 716 PITTSFIELD MA

POSTAGE WILL BE PAID BY ADDRESSEE

NetworkWorld

PO BOX 5090
PITTSFIELD MA 01203-9838

Your resource for enterprise network computing information.

FREE Product Info

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST-CLASS MAIL PERMIT NO. 716 PITTSFIELD MA

POSTAGE WILL BE PAID BY ADDRESSEE

NetworkWorld

PO BOX 5090
PITTSFIELD MA 01203-9838

FREE Product Info

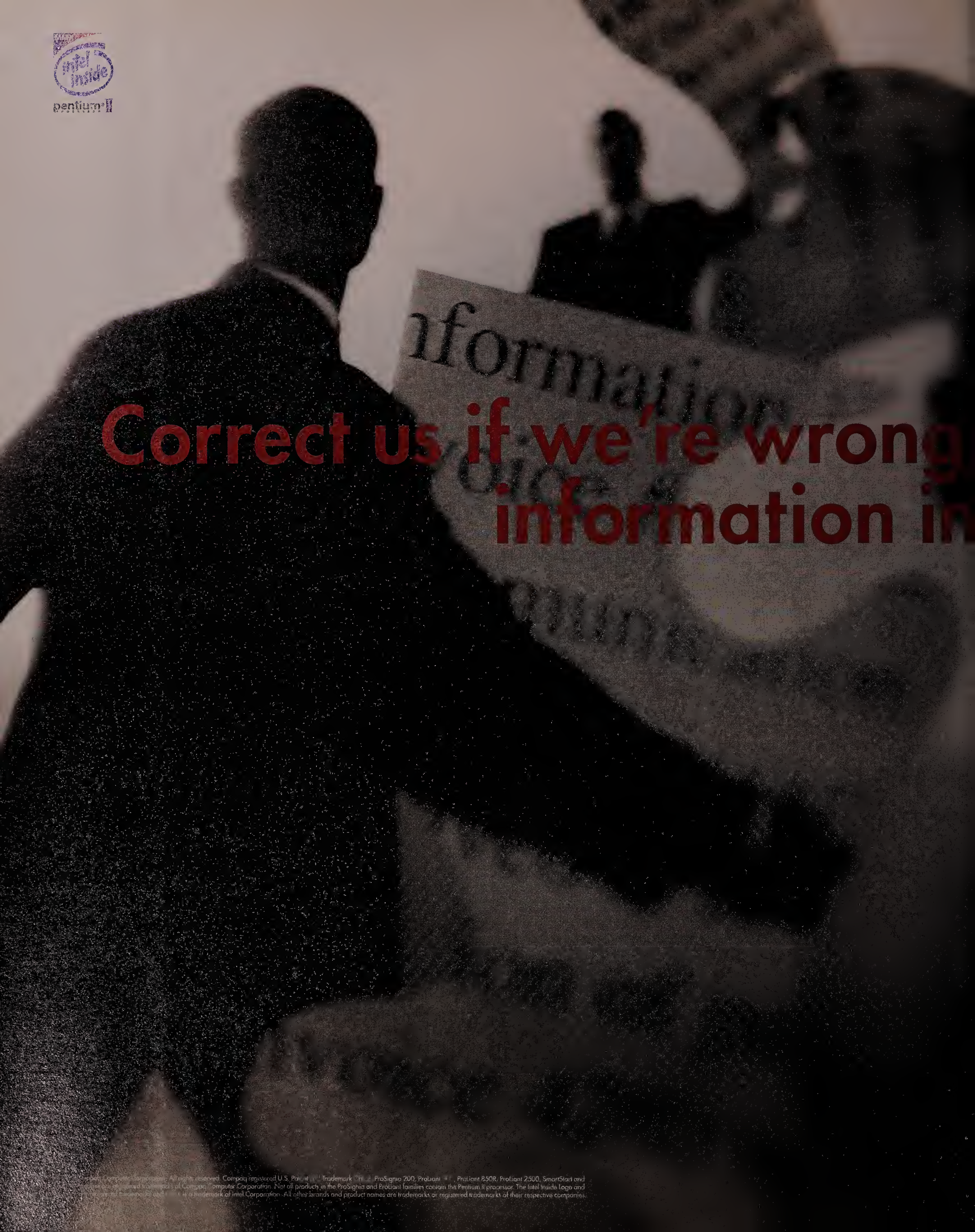
Floods. Hurricanes. Tornadoes. Bob.

Protect your company's phone service from all kinds of catastrophes. Get Disaster Routing Service from Southwestern Bell Telephone Company. Call 1-800-933-2355 and receive a free *Emergency Management Guide for Business and Industry*.

Southwestern Bell

Circle Reader Service #16

Visit us at www.swbell.com.


Correct us if we're wrong
information in

[illegible] Computer Corporation. All rights reserved. Compaq registered U.S. Patent and Trademark Office. ProSignia 200, ProLiant [illegible], ProLiant 850R, ProLiant 2500, SmartStart and [illegible] registered trademarks of Compaq Computer Corporation. Not all products in the ProSignia and ProLiant families contain the Pentium II processor. The Intel Inside Logo and [illegible] trademarks and [illegible] is a trademark of Intel Corporation. All other brands and product names are trademarks or registered trademarks of their respective companies.

but we presume all of the your company is critical.

Presenting workgroup servers from Compaq. Put simply, the goal is to minimize cost and risk for your business. To that end, we're offering a full line of workgroup servers to meet a range of functionality and budget needs. The ProSignia 200 is an entry-level server at the price of a desktop. The ProLiant 800 provides excellent price:performance and expandable features. The ProLiant 850R is a new one we're excited about. It's the industry's first rack-ready, high-density workgroup server that won't cause hemorrhaging in the accounting department. And the scalable, high-performance ProLiant 2500 is quite possibly the most flexible server you can buy. No one in your company need compute like a second-class citizen again.

No matter which of our servers you choose, you'll receive a full suite of management software from Compaq like SmartStart and Insight Manager to easily deploy and manage your server.

Optimizing your workgroup's overall performance is also done simply with Compaq's range of memory and hardware options like manageable UPS products, a full range of tape backup and proven RAID technology that integrates seamlessly into existing networks.

Workgroup servers and options from Compaq. One place where trickle-down economics actually works. For more information, visit us at www.compaq.com/product/servers.

COMPAQ

date's skill and experience and be prepared to meet it from the outset.

Additional enticements are important, too. You'll still have to sell hard the attractions of coming to work for you and your organization. What's more, you'll probably need to adjust the salaries of the technical staff you already have.

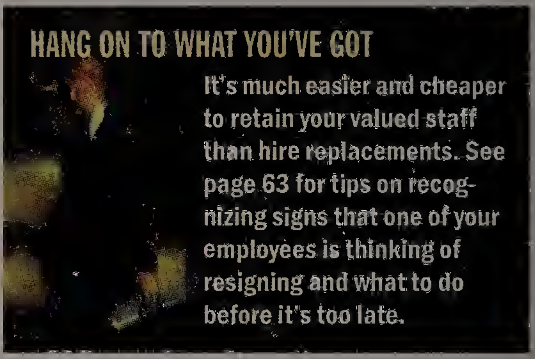
When Choate Rosemary Hall needed to hire a few Windows NT administrators and network technicians, its managers were shocked at the salaries people with those skills were commanding. "We asked the HR department to do a market analysis," Knoll recalls. The analysis confirmed what the hiring managers had already discovered: sky-high salaries. Despite the attractions of working in a small, low-key environment in which people are given substantial autonomy and work on the latest technology, "we had to adjust our salaries. We had to be in the ballpark," she notes.

Other organizations turn to signing bonuses to attract new hires. Signing bonuses range from $2,000 to $5,000, reports Specific Recruiting's May.

Sometimes a generous benefits package will sweeten a lower salary. For example, the University of Chicago Hospitals provide a 401K retirement plan to which the organization contributes 7.5% of the employee's salary, says Jim Oddo, manager of data communications.

To get an employee a larger raise than the pay structure allows, Oddo might also promote the person, which moves the employee up a notch on the salary ladder.

Don't forget that the salary issue doesn't go away. "Most companies have traditionally looked at salaries once a year and made adjustments accordingly," says KPMG's Harts. With salaries for many technology positions increasing at double-digit annual rates rather than the 2% to 3% companies expect, "companies have to review and adjust salaries more frequently," he advises.



HANG ON TO WHAT YOU'VE GOT

It's much easier and cheaper to retain your valued staff than hire replacements. See page 63 for tips on recognizing signs that one of your employees is thinking of resigning and what to do before it's too late.

"I am aware that any of our technical people can go out on the street and get a 10% increase tomorrow," says O'Brien at Wallace Computer Services. Recognizing that, the company has implemented a variety of policies designed to keep people there, ranging from rotating people among choice projects to lucrative profit sharing and stock-option programs. It also makes adjustments to the salaries of existing staff to reflect the latest market value.

As O'Brien has found, higher salaries tend to throw a company's delicately balanced salary structure out of whack. Senior employees with the same technical skills and who do the same work want the same pay.

"Telling new hires not to reveal their salaries simply is not realistic," says Boise Cascade's Walsh. Whether or not managers like it, everyone pretty much knows what everyone else is making. The company has adjusted its annual review process to allow a midyear review and adjustment. "Now I have two shots at readjusting the salaries of the staff, which helps me resolve the internal salary equity issue," he says.

Some managers see the current hiring environment as an anomaly driven by the disparity between supply and demand for people with technical skills that's bound to correct itself sooner or later. But if networking and communications are key to your business strategy, the intense competition for top technical people isn't likely to diminish.

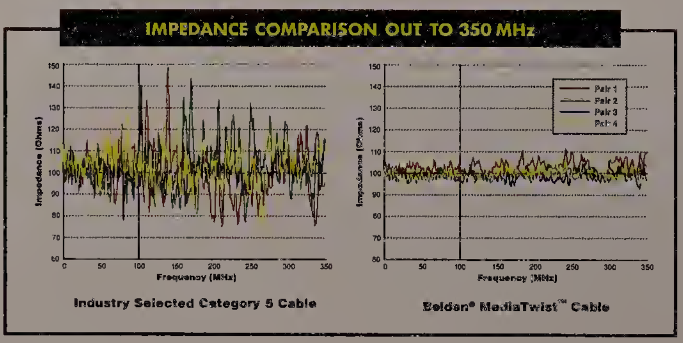
Radding is a freelance writer in Newton, Mass. He can be contacted at aradding@world.std.com

Belden® MediaTwist™ is an entirely new generation of cable tested and certified on multiple systems above 100 MHz. Offering exceptional gains in all critical electrical areas, MediaTwist is the new benchmark for UTP(Unshielded Twisted Pair) technalogy.

MediaTwist isn't just a netwarking cable, it's a multimedia cable, FCC certified far digital videa systems. It pravides unprecedented perfarmance, supparting diverse applicatians in videa, data, and vaice technalogies.

With MediaTwist, Belden has taken bonded pair technalagy to a new level. A unique crescent-shaped design, featuring bonded pairs locked in place, maintains both conductor-to-conductor and pair-to-pair uniformity. The result is stable electrical performance across *all* verified frequency ranges, even *after* enduring the rigors of installation.

Look to MediaTwist for multimedia, extended distance, or shared sheath applications. It's also backed with a lifetime warranty to the original end user.



MediaTwist offers a golden opportunity to fulfill your multimedia needs. For product and technical information, visit our web site at **http://www.belden.com** or call:

1-800-BELDEN-4

Belden

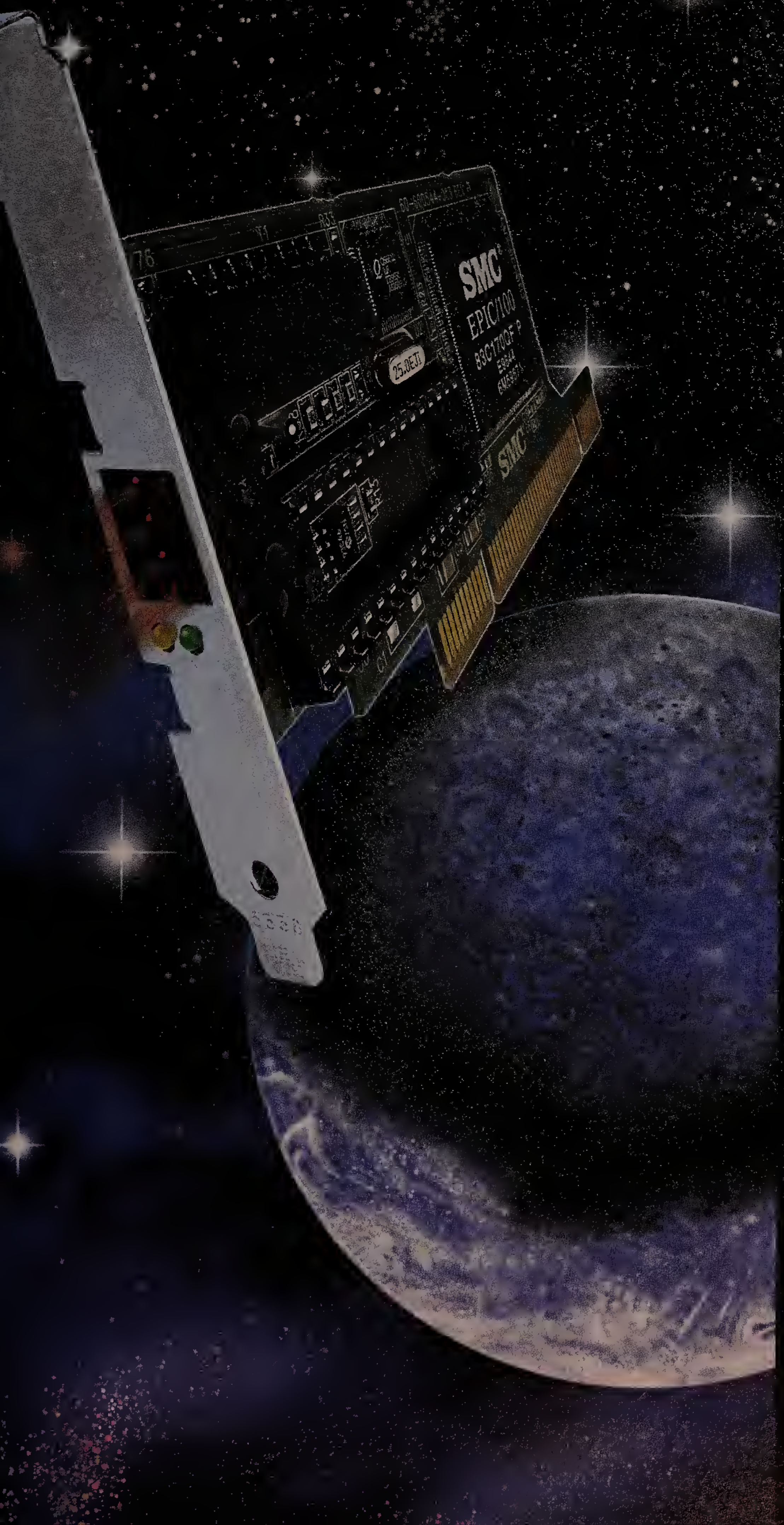
© Copyright 1997, Belden Inc.

Circle Reader Service #11

SMC's new Fast Ethernet cards are the fastest in the galaxy.

Especially when connected to the mother ship.

TigerStack 100



Fast Ethernet solutions from SMC.

When you're launching a Fast Ethernet initiative, you know it pays to buy the best entry vehicle.

And an independent study* shows that SMC's new EtherPower™ II 10/100 network card offers the industry's best price/performance. With top throughput. Unsurpassed CPU utilization. 10/100 Auto-Negotiation. The easiest installation. For as little as $78—the lowest suggested retail price around.

Add our SwitchReady™ TigerStack™ 100 hubs for a complete Fast Ethernet workgroup solution that includes advanced management, the ability to create multiple segments within a stack, plus 10/100 Mbps switching and seamless integration at a breakthrough price.

For added versatility, SMC's Network Management Unit (NMU) supports a full range of unified management options, including SNMP and RMON. Plus, for a limited time, you'll receive FREE integrated Fast Ethernet switching to boost bandwidth, connect to legacy LANs, and support topology extensions (see below for details).

And the entire solution is backed by the industry's strongest Customer Satisfaction Guarantee.

The SMC Fast Ethernet workgroup solution. One giant leap for your network. And one very easy step for you.

CUSTOMER SATISFACTION GUARANTEE

SMC®

Connect With Us.

Stack, switch, and save! Buy an SMC TigerStack 100, get 3 FREE SMC EtherPower II 10/100 cards! Buy an SMC TigerStack 100 Network Management Unit, get a FREE 4-segment SMC Integrated Switch Module. Visit www.smc.com/network/promo/stacksav.html.**

1-800-SMC-4-YOU, Dept. SS06

*Source: KeyLabs, Inc., February 1997. **Limited-time offer. Program is subject to additional terms and conditions, is valid in the U.S. and Canada only, and is available only to prospects qualified by SMC in its sole discretion. Program is subject to change or cancellation by SMC without notice. Limited supply only. Offer valid 7/1/97 to 8/31/97. Not available to resellers, distributors, or Federal agencies.

© Copyright 1997 Standard Microsystems Corporation

*Circle Reader Service #***28**

YOUR DATA IS A HARRIED COMMUTER WITH A HONKING BRIEFCASE. WE'RE THE BULLET TRAIN.

The network is a railbed waiting for an express locomotive. Paradyne digital network access products are said vehicles. DSU/CSUs, including a whole string specially outfitted for frame relay - our FrameSaver™ series. Tough-as-rails T1 access multiplexors for voice and data integration. And our new HotWire™ DSL systems that will send your data streaking to its destination with nary a delay.

Paradyne. Get on with it. www.paradyne.com or 1 800 Paradyne

PARADYNE™

FrameSaver and HotWire are trademarks of Paradyne Corporation.

© 1997 Paradyne Corporation

CONSOLIDATED SERVERS, LED BY CUBIX, HOLD SWAY OVER TRADITIONAL PCs IN MANAGEABILITY AND RELIABITY.

Better management through consolidation

by Joel Snyder

One way to monitor and manage your servers is to neatly pile them on top of each other, then tuck what's left under desks and behind cabinets where you can see and reach them.

A better way is to invest in a consolidated server that enables you to stuff multiple servers on processor boards in an industrial-strength chassis, where they can share redundant fans and power supplies. With a consolidated server, you'll clean up the unsightly mess, improve management, decrease downtime and get repairs done more quickly.

That's our assessment after popping the hood to examine consolidated servers from Cubix Corp., CommVision Corp. and ChatCom, Inc., the three market leaders.

While the systems are similar, Cubix's PowerSMP Series 4000 earned our Blue Ribbon for offering the highest performance and reliability in environments with little or no configuration changes.

Cubix combines its custom-made processor boards that support high-end symmetric multiprocessing (SMP) with excellent monitoring and management software. And because it does all this at a stellar price (see story, page 60), the PowerSMP Series 4000 also merits a Best Buy rating.

ChatCom builds a nice chassis, but the firm's ChatterBox ChatPower-Plus is more limited than Cubix's PowerSMP Series 4000 when it comes to management. On the plus side, it is more flexible than the Cubix unit in environments requiring a mix of processor types, peripheral devices and add-in cards.

CommVision's CommSwitch 2500 packs its processor boards in tight — fitting as many as 10 CPUs in a 10-inch-high chassis. But high cost, poor management and a strange reliance on Novell, Inc.'s NetWare keeps its score below Cubix's.

The fix is on

One of the major ways consolidated servers distinguish themselves from traditional PC-based servers is by their higher degree of fault tolerance and the time it takes to repair a problem. Fault tolerance in consolidated servers is handled largely through redundant components, particularly multiple fans and load-sharing power supplies.

When it comes to making repairs, we examined how easy it is to get at and fix processor boards and components in each vendor's chassis, which all fit into 19-inch racks.

All three vendors make swapping out server modules easy, although ChatCom was the easiest by far. The firm puts the processor and disk drive on one motherboard that slides into the chassis from the front panel. When something fails, all you have to do is yank out the problem board, replace the failed piece and slide it back in.

However, ChatCom makes no provision for gracefully shutting off power to a single board. We were worried that we'd fry one if we inserted it at the wrong angle, but we didn't have any problems.

With CommVision, all you have to do is pop the top of the chassis to replace processor boards. However, it's not easy to swap out CommVision disk drives, which are mounted separately from the processor board. If you have a lot of drives, swapping one out requires taking apart a large chunk of the chassis and shutting down the entire box, because the clearance between the hard drives and server modules is too tight.

Score Card

	Architecture/ Design (20%)	Fault Tolerance (15%)	Mean time to repair (15%)	Management (25%)	Price/ Performance (25%)
7.7 Cubix	8	8	6	8	8
6.2 ChatCom	7	7	8	4	6
5.8 CommVision	5	8	4	5	7

Scores are based on a scale of 1-10. Percentages are the weight given each category in determining the overall score.

The Cubix chassis makes changing server modules and separate disk drives easy as long as you don't mind wading through a preponderance of cables.

Though short disk drive cables provide for cleaner installation and better airflow, they have so little slack that a wrong move could dislodge a cable from the connector. Likewise, moving one board in a full chassis could easily disconnect adjacent boards from their disk drives.

Go online to get an understanding of the advantages of consolidated servers, as well as links to more information about the reviewed products.
www.nwfusion.com 3417

All the products provide easy access to power supplies, but not to fans. Cubix has the only chassis that permits you to change all the fans without shutting down. The other two require major disassembly to get at all the fans.

Each of the systems has other engineering defects that may shorten their mean time between failures. For example, the single power cable on the ChatCom chassis leaves it unprotected from one of the major causes of system failure — power interruption. Cubix puts two power cables on its chassis, while CommVision puts a different power cable on each power supply.

CommVision, with fewer cables than Cubix or ChatCom, is positioned for the fewest failures. However its reliance on a processor running NetWare to load BIOS into each of the server modules is a weak link, because if that processor fails, you can't reboot. The other vendors use the more traditional boot method of loading BIOS on the processor board.

Managing for success

All of the systems' engineering features call for high levels of management control.

Cubix is the leader in management services, even though we found glitches in its GlobalVision software. The package can be used to monitor and manage multiple chassis from one workstation by communicating with software on every processor board in each chassis. This enables you to cycle power, schedule a shutdown, disable dial-in access and reboot from one place.

In theory, the management software also is capable of monitoring chassis environmental information such as temperature, fan and power-supply status. We had no problem using the software to get temperature readings, but the feature that was supposed to alert us when the temperature got too high didn't work because of a bug. Thanks to another bug, the management soft-

Net Results

	PROS	CONS
PowerSMP Series 4000 *Cubix Corp.* *(702) 888-1000* *www.cubix.com*	▲ Strong fault tolerance ▲ Smooth engineering ▲ Excellent centralized management	▼ Hard to reconfigure ▼ Fixed backplane configuration
CommSwitch 2500 *CommVision Corp.* *(415) 254-5270* *www.commvision.com*	▲ Flexible reconfiguration ▲ High density ▲ High mean time before failure	▼ Requires NetWare knowledge for proper management ▼ No environmental monitoring ▼ Limited centralized control
ChatterBox ChatPower-Plus *ChatCom, Inc.* *(818) 709-1778* *www.chatcom.com*	▲ Easiest to reconfigure ▲ Uses industry-standard motherboards ▲ Good for a test lab environment	▼ High cost ▼ Limited management ▼ No environmental monitoring

ware failed to detect when we shut down fans or power supplies. Luckily, the front panel lights picked up those conditions.

GlobalVision also can automatically start up a remote-control application so you can see what is on the screen of each processor. This is all done in software, though, requiring a separate instance of the remote-control application to be installed on each server module.

CommVision also offers a management package — NetVision — but it doesn't have anywhere near the features of GlobalVision. Instead, NetVision is oriented toward setup and configuration.

ChatCom's management strategy is in line with its architecture. Because each processor board is considered a separate system, you don't manage them together, which is OK if that's what your environment requires. ChatCom also lacks remote management and environmental monitoring.

However, ChatCom includes its Intelli-Management software and firmware on each card for minimal management of the system, such as providing for an automatic hung-processor reboot. It's difficult to say how well Intelli-Management works, because what we got from ChatCom was an undocumented beta product, and we weren't sure what to test.

These are not your father's PCs

The construction of the three products reflects their goal of attaining high availability. Each has multiple, heavy-duty power supplies and can be daisy-chained to simplify management by enabling multiple chassis to share peripherals and power supplies.

All three products are administered from a shared monitor, keyboard, mouse and disk drive. To connect to the CPU board of your choice, you just press a front panel button or toggle a switch.

Cubix and CommVision have shrunk their chassis heights to 9 and 10 inches, respectively. Each vendor makes its own single-CPU boards that are about the size of a normal PC add-in card.

ChatCom relies more on off-the-shelf components, so at 22 inches, its chassis is much taller. There's so much room on the inside of the chassis that ChatCom can produce boards with two 166-MHz Pentium CPUs and two disk drives.

ChatCom took the most laissez-faire approach to design, making each processor board in its system independent of the others. Each CPU can have a ribbon cable connection to a shared floppy or have its own floppy.

The self-contained processor boards ChatCom produces enable you to mix and match various processor types in the same chassis. You can get up to a 200-MHz Intel Corp. Pentium Pro CPU with 256M bytes of dedicated RAM, a disk drive and a network interface card (NIC) on a ChatExpress board. Each ChatExpress board takes up two or four chassis slots. The two-slot board has room for two ISA or PCI plug-in cards, while the four-slot board can accept four ISA and three PCI or three ISA and four PCI add-ins.

ChatCom also makes ChatTwin cards that can have two 166-MHz Intel Pentium CPUs. Each CPU can have up to 128M bytes of RAM as well as its own disk drive and NIC. ChatTwin cards take up one slot in the chassis. However, they cannot accept PCI or ISA cards.

From a hardware point of view, Cubix's system is more tightly integrated. Its homegrown server modules run the gamut from low-end CPUs to a 200-MHz Pentium Pro with SMP. CPU cards can have one or more PCI or ISA slots and plug into a single backplane. Although the backplane can be segmented, configuration options are somewhat constrained. Therefore, you have to make some decisions about what you're going to do with a Cubix system before you order it from the vendor.

Everything about Cubix's system looks and feels as if it was engineered by people who know what they're doing. Although tightly integrated with an environmental monitoring system, Cubix server modules are independent of each other and don't depend on a central controller for booting or configuration.

Not so with CommVision. Although it has design and manufacturing capabilities similar to Cubix, it has taken a different approach to system integration. In the CommVision system, one CPU is dedicated to the task of operating the chassis, which isn't such a good idea: If that CPU doesn't boot, none of them boots. However, if that CPU crashes after booting, the others can continue to run.

CommVision's unique feature is its internal PacketBus, which is used for interprocessor communications. Each board in the chassis runs a special driver that makes the PacketBus appear to be a LAN segment. PacketBus drivers are available for CPUs running Windows 95 and NT, MS-DOS, OS/2 and Novell's UnixWare and NetWare.

The PacketBus eliminates the need to have a separate LAN connection for each CPU. Instead, you only need one for the entire chassis, and it has to run Novell's NetWare 4, which acts as a router passing IP and IPX packets from the PacketBus to a real LAN.

When you factor in hardware design, reliability features and management applications, consolidated servers look attractive. Our experience with these products was good enough to recommend consolidated servers as a way to reduce management costs and increase reliability.

Snyder is a senior partner at Opus One, a consulting firm in Tucson, Ariz., specializing in networks, security and e-mail. He can be reached at jms@opus1.com.

The cost difference

Bringing in a consolidated server to tidy up your computer room and ease your management woes isn't going to cost much more than deploying individual servers.

In fact, if you buy from Cubix Corp., it may even save a few thousand dollars.

We compared the cost of 10 individual servers with that of a single consolidated server with 10 133-MHz Pentium CPUs, 16M bytes of RAM for each CPU, 10 internal disk drives and management software.

A check in the MicroSystems Warehouse catalog shows 10 Digital Equipment Corp. Venturis GL servers with 16M bytes of RAM goes for $22,000, while 10 Hewlett-Packard Co. Net-Server E-40s with 16M bytes of RAM can be had for $24,000. You can add in about another $1,000 for a shared monitor plus a monitor-switching unit to bring the total cost for 10 individual servers to between $23,000 and $25,000.

In contrast, the low-price leader among consolidated servers was Cubix's PowerSMP Series 4000, which was surprising given that we found it the most full-featured, as well. At $17,000, Cubix's PowerSMP Series 4000 was a clear winner and, therefore, a Best Buy.

CommVision Corp.'s CommSwitch 2500 was slightly higher, at about $28,000, while ChatCom, Inc.'s ChatterBox came in at roughly $32,000.

When you consider the time you'll save using a consolidated server's management and configuration software, even the two higher priced units can be less expensive than individual PCs.

— Joel Snyder

Comparing costs

Product	Chassis cost	Cost per server board	Total for 10 servers
PC-based servers	N/A	N/A	$23,000 to $25,000
Cubix	$3,000	$1,400	$17,000
ChatCom	$4,500	$2,800	$32,500
CommVision	$8,395	$1,970	$28,095

When Chiquita needed superior installation and customer service, we were ready for the call.

As the world's largest banana grower saw business ripening in Europe, it chose the telecommunications company that could help reach new markets with speed and efficiency. To open Chiquita's Geneva office, Swiss Telecom streamlined the process to a matter of weeks, providing soup-to-nuts consultation. "At every level they offered a 'customer first' orientation," said C. Richard Keener, V.P. of Information Systems. If fast, reliable communications links and dedicated customer service sound appealing, call the company Chiquita picked out of the bunch. Call Swiss Telecom North America at 1-800-966-1145.

SWISS TELECOM PTT

Your best connection

Circle Reader Service **#18**

Product Series No 5.

Adaptive Networking

BAYSTACK™ 350 AUTOSENSE SWITCH

The answer isn't 10 mbps or 100 mbps. It's all of the above.

Adapt to it.

BayStack 350T

BayStack 350F

BAYSTACK™ 350 10/100 MBPS AUTOSENSE SWITCH

REASON No. 1

Every port automatically assigns 10 or 100 mbps

REASON No. 2

Lowest price per port*

REASON No. 3

No network reconfiguration required

REASON No. 4

Award winning performance

Your 10 mbps Ethernet solution was so good, some of your users are already clamoring for 100 mbps. That's the problem: reconfiguring your network is one headache you don't need. Now Bay Networks Adaptive Networking has the keys to migration without migraines.

The BayStack 350 Autosense Switch is the most affordable high performance 10/100 mbps switch you can buy. But more important, its autosense feature automatically detects whether the connected devices are 10 or 100 mbps, and allocates the right bandwidth.

So, simply by installing the BayStack 350, you can make the migration inexpensively, effortlessly and on your own schedule. It's small, available in both copper and fiber versions, and it's already won awards from Network Computing and LAN Times.

Go from 10 mbps to 100 mbps at your own speed. Visit our Web site at www.baynetworks.com/bs350/nw or call us at 1-800-8-BAYNET ext 347.

1.800.8.BAYNET ext. 347

Bay Networks

**$249 per port – US list price for BayStack 350, as of August 1, 1997.*

www.baynetworks.com/bs350/nw

© 1997 Bay Networks, Inc. BayStack is a registered trademark of Bay Networks, Inc. All other trademarks are the property of their respective holders.

Circle Reader Service **#10**

Management Strategies

Recognizing discontent

Learning to catch the early warning signs of employee dissatisfaction can help prevent staff defections and promote harmony.

By B. Lynn Ware

An IT executive at a high-tech company in Silicon Valley arrives at work one morning to find that the company's top programmer Mike Jones has requested a meeting. Jones announces that after much consideration, he's decided to join a competing local firm.

The stunned manager had no idea the programmer was unhappy. Jones had worked for the company for five years and was the employee who always came in the earliest and left the latest. The executive could count on him whenever emergencies occurred.

Hoping to retain Jones, the manager asks human resources to approve a raise or bonus. But it's too late — Jones isn't interested. The programmer had been sending unspoken signals that he was dissatisfied with his job, but his manager failed to see them.

Convincing employees to stay after they've already tendered their resignations is a difficult task. As many managers have found, money isn't a panacea.

Employees most often leave their resignations on the table and resist persuasion to stay. Even if a manager talks an employee out of leaving, that same worker often departs six to nine months later.

Fine-tune your antenna

Whether managers realize it or not, unhappy workers often send unconscious and conscious signals of dissatisfaction long before they give notice. Managers who pick up these warning signs early enough can take steps to remedy the causes of dissatisfaction and deter valued employees from resigning.

Jim Burgess is a hard-working professional who's usually the first into work and the last to leave. All of a sudden, his schedule is strictly 9 to 5. What happened?

Mary Roberts is a network administrator who never complains when things go wrong. In fact, she often works even harder when a problem crops up. But Roberts recently has begun complaining about the slightest setback.

Tom Davis, a software development programmer, has chronic knee problems resulting from an accident on the basketball court. He sees a physical therapist on a regular basis. In the past, he's scheduled his appointments for hours that don't conflict with work. Now he's going to sessions during work hours.

Although the names have been changed, all of these are actual situations indicative of employees who have become dissatisfied with their posts (see graphic). You may pick up on these types of subtle changes in behavior. Once an employee starts to give these signals, what can you do?

Are you saying sayonara to a staffer who resigned? Replacing the employee could be a challenge. Turn to page 51 to learn the inside scoop on the changing rules of the IS hiring game.

Decide what you want

Before you quickly launch an effort to regain an employee's loyalty, decide whether the employee is worth retaining. It's shocking how few managers know which specialists on their staff fit into the company's larger game plan.

WARNING SIGNS

Signs that an employee is thinking about resigning:

- ▶ Noticeable change in behavior patterns
- ▶ A noncomplainer expressing personal discontent
- ▶ Declining productivity
- ▶ Employee begins seeing good qualities in competitor's goods and services
- ▶ Employee expresses a need that doesn't get fulfilled and can't understand why he has been denied
- ▶ Employee begins to complete unfinished business, personal or professional

One manager recently lost a midlevel professional who specialized in encryption. Although the employee wasn't a top performer, the manager was aware that his company would soon launch a major division to develop encryption products, and employees with expertise would be in short supply. Six months later, the position is still vacant.

Ask yourself, "How valuable is this individual to attaining our goals?" More importantly, how valuable is this individual — and, in fact, every member of the staff — to the company over the next few years? When you have that answer, it's time for the next step.

If you determine an employee is worth fighting for, you then need to determine the cause of the worker's unhappiness. Is it compensation or are there interpersonal or motivational reasons?

If your employee is being paid less than others in the department or in his industry niche, a boost in pay may persuade him to stay, assuming the employee is happy in all other respects.

When money isn't the problem

Are interpersonal problems causing dissatisfaction? You need to play detective to get to the root of the problem and make efforts to help iron out the issues. Are there problems in team dynamics? Your intervention, even if you aren't 100% successful, can change your employee's feelings about the company from negative to positive.

Go online for more tips on retaining your valued employees.

www.nwfusion.com

FIND IT ON FUSION 3416

Is the employee stymied in his career objectives or professional development so his motivation is reduced? You need to think about the individual's long-term career goals and objectives. You do know what these are, don't you? If not, you should.

If your employee is involved in software maintenance but ultimately wants to become a software developer, it's important to know. Have him do the job that he's paid for but also steer him to other assignments and job rotations that will help him reach his long-term goal.

If the grooming can't transpire in your department, perhaps you could arrange an assignment in a colleague's area on an ad hoc basis. Taking any of these steps will help encourage your wavering staff member to stay.

Yes, it seems paradoxical. Why should you help your employee acquire skills that will cause him to move on? The reason is that your understanding and support promotes loyalty to you and your company. This is known as the "Zen of Retention."

Sooner or later, your employee will move on. So will everyone. But if you follow these tips for retaining valued workers, they may help you achieve your near-term business goals without the upheaval and expense turnover causes.

Ware is president of Integral Training Systems, Inc. in Half Moon Bay, Calif. She can be reached at its1@aol.com.

We want to hear from you

Send us your ideas for upcoming Management Strategies stories. Contact Amy Schurr by phone at (508) 820-7485 or by e-mail at amy_schurr@ nww.com.

Serve Christ in the Rocky Mountains

Want to serve the Lord with your computer skills in beautiful Colorado Springs? The Navigators, aiming "to know Christ and to make Him known" for 64 years, invites your resume for:

DATA MIGRATION PROGRAMMER
- Programming experience or degree in Computer Science required
- IBM AS 400, Oracle, and SQL experience desired

SOFTWARE DEVELOPER
- 3 years programming experience required
- PeopleSoft experience desired

ORACLE DBA
- 3 years of Oracle experience required
- Supervisory and Unix experience desired

PEOPLESOFT ADMINISTRATOR
- 4 years of systems administration experience and supervisory experience required
- PeopleSoft experience, Oracle, SQL, and Unix experience desired

PEOPLESOFT TRAINER
- 2 years of experience using/training PeopleSoft Human Resources, Payroll, GL & AP required
- 3 years PC and Mac training, Win 95 training experience required
- Training/teaching experience required

Send resume by e-mail to: **Jan_Beckett@Navigators.org or fax (719) 260-0479 or phone (719) 594-2359 or write P.O. Box 6000, Colorado Springs, CO 80934**

THE NAVIGATORS

SS7

We are seeking Professionals with ATM and SS7 experience to join our AIN Team. Contract and permanent positions available nationwide.

TransTech
making IT happen

Attn: Jackie Mari
Phone: 1.800.676.7374 ext. 234
FAX: +1630.717.0909
jmari@trans-tech.com
www.trans-tech.com

THE BEARDSLEY GROUP

SPECIALISTS IN INTERNETWORKING RECRUITING

We are your source for jobs!

- ✱ System Engineering
- ✱ Network Consulting
- ✱ Contract Positions
- ✱ Network Analyst
- ✱ SALES Internetworking

See our complete listing of Jobs at:
http://www.beardsleygroup.com
or contact us at:
Tel 203 944 0050/Fax 203 944 0052
Email jobs@beardsleygroup.com

Software Engineer: 3 openings. Provide computer consultation services to software engineering and technical professionals to design and implement computer programs for calculating prices of specific products in the energy field for international markets. Consult with computer programmers regarding creation of computer programs to determine the potential profit margin and/or loss anticipated to assist traders in determining margins of risk. Determine valuation of various financial derivatives products in energy industry. Design and create programs, utilizing Oracle and UNIX. Requirements: B.S. Computer Science and 1 year experience in job offered. Salary: Salary range: $45,000 to $55,000/year DOQ for 40hrs/wk. Apply at Texas Workforce Commission, Houston, Texas or send resume to Texas Workforce Commission, 1117 Trinity, Room 424T, Austin, Texas 78701. Job Order # TX 7857531. Ad paid by an equal opportunity employer.

For More Information
on Advertising
in Networking Careers

1-800-622-1108

Administrator, Computerized Health Information Systems: Administer computerized health information systems consistent with standards of accrediting and regulatory agencies. Direct modifications in existing computer data processing systems in the areas of clinical records and personnel. Develop and supervise the implementation of billing and accounting systems for third party payments such as Medicare and Medicaid utilizing C and C++ computer languages in a UNIX environment. Supervise personnel and develop in-service educational materials. Evaluate data regarding reimbursement, facility planning, quality of patient care and risk management, and make report of findings to President. Represent the employer at meetings held by the Department of Health and other government agencies and report to employer any changes in the rules and regulations. Requirements: M.S. Computer Science. One year experience in job offered or one year as systems analyst bealth facility. Salary: $52,000/year for 40 hrs/wk. Apply at Texas Workforce Commission, Houston, Texas, or send resume to Texas Workforce, 1117 Trinity, Room 424T, Austin, TX 78701. Job Order #TX 7857545. Ad paid for by equal Opportunity employer.

TECHEXPO '97™

TECHNICAL HIRING EVENTS FOR EXPERIENCED COMPUTER PROFESSIONALS

The best jobs. The best companies. The best single day you can ever spend to advance your career.

Philadelphia	New York City	New Jersey	Connecticut
Tue. AUG 19	Tue. AUG 26	Thur. AUG 28	Wed. SEPT 24
10 am - 6 pm	9 am - 6 pm	10 am - 6 pm	10 am - 6 pm
Pennsylvania Convention Ctr Philadelphia, PA	The New York Sheraton 7th Avenue at 53rd St.	The DoubleTree Hotel 200 Atrium Drive • Somerset	The Stamford Sheraton 1 Stamford Place • Stamford
Travel directions only: (215) 418-4989	Travel directions only: (212) 581-1000	Travel directions only: (908) 469-2600	Travel directions only: (203) 967-2222

FREE ADMISSION! BRING MANY RESUMES! **For Companies wishing to exhibit call: (212) 505-1780**

These companies will be hiring at one or more of the above events:

IBM Corp. • Lockheed Martin • Merrill Lynch • PeopleSoft • Perot Systems • Bloomberg L.P. • American International Group Dow Jones & Company • Prudential • CNET: The Computer Network • Prodigy • Oracle • Unixpros • MTV Networks / A Viacom Co. • Coopers & Lybrand • Northrop Grumman • KPMG Peat Marwick • The Wharton School • AARP Healthcare Options • GE Capital, ITS • EDS • Bell Atlantic Network Integration • Thomson Financial Services • NYNEX • T. Rowe Price Assoc • AT&T Resource Link • Lenox China • Advanced Computing Techniques • Approach • AE Feldman & Assoc. • Aegis Software • Aerotek/Maxim Group • Ajilon Services • Allegheny Health Education Research • Allied Signal/Guidance and Control • Allstates Design & Development • Alternative Resources • Applied Concepts • Arcus Data Staffing • BDM International • Beechwood Data Systems • BIT Corp • Brickhouse Data Systems • CAP Gemini • Career Group • 99 Services • Triad Data • Case Technologies • CDI Information Services • CG Computer Services Corp. • Chubb Computer Services • ACR • Computer Consultants & Contractors Newsletter • CMI • Prolifics • AFS & LSC • Context Integration • CP Interactive • CTG • CW Costello & Associates • Communication Systems-East • DIS Research Ltd. • Intera • Dux International/Kenda Systems • PC Etcetera • EDP Contract Services • DecisionOne Corp.• EDS Global Telecommunications Division • Gartner Group • Computer Mechanic • Gec-Marconi Hazeltine • Grace Technologies • Harris-Electronic Systems Sector • Chubb & Son • Hexaware Technologies • Hobart Information Technology • Holden Partners • Inacom • Summit Bank • Howard Systems Int'l • ILX Systems • IMI Systems • FitLinxx • Indotronix/IIC Software Solutions • Integrated Systems Consulting • InfoManage • IPEC Precision • ITT Avionics • JDA Software Group • JM Information Technology • Intersolv • Keane • ITT Aerospace/Communications • Kinderhook Systems • Lexstra Int'l • DMR Trecom • LinkPoint • LANcomp • Logical Design Solutions • Logistic Solutions • McIntyre Information Technology • Nesco Information Systems • Noblestar Systems • Origin Technology • Paragon Computer Professionals • PCSI• PLP/Professional Partners • OPCENTER • Predictive Systems • Professional Computer Solutions • Professional Data Solutions • RHI Consulting • ProVision Technologies • Realtech • RMS Computer Corp. • Rohn Rogers Associates • RWD Technologies • Simulate • Solutions Through Data Processing • Staffworks • Source EDP/Consulting • IKDN-Valinor • Spectrum Concepts Consulting • Spectrum Technology Group • Stream International • Structured Logic Co. • Systems Methodologies/SMI • Modern Technologies • Taratec Development Corp • The A Consulting Team Inc./TACT • The Concorde Group • The Constell Group • The Horizon Group • Tiffany Computer Systems • Vanstar Corp • Universal • Tiger Information Systems • TelTech • TSC • Vitech Systems Group • Techno-Trac Systems • Yoh Scientific • Telos Corp • Forte Systems • Output Technologies • GHI/Grouphealth • IPC Information Systems • TotalTec Systems • Pierce Technology • Concepts in Staffing • Information Technology Partners • Volt Technical Services • Pep Boys • Susquehanna Investment Group • Automated Concepts • Rotator Services • Claremont Technology Group • BFR Systems • Design Strategy • Icon Solutions • Client Technologies • Creative Technologies • DataCap • Princeton Information • SMS • Strategic Technology Resources • ExecuTrain • Ciber, Inc. • RICDMM • SEI Investments • Vital Computer Services International • Depository Trust Co. • Devon Consulting • Scarborough Research • The Molloy Group • Proscape Technologies **& many more.**

OPEN POSITIONS: Programmers Senior & Junior Levels, Analysts, Developers, Architects, Financial & Systems Analysts, Modelers, DBA's, Project Managers/Leaders, Sys Admins, Telelecom, Process Re-Engrs & Integrators, All Systems Enginrs, All Tech Support, Internet Security, HelpDesk, Testers, TechWriters, Telecom Wiring Specs, CNE's, LAN/WAN & Satellite Techs, ASIC & Power supply Engnrs *& more!* **ALL SOFTWARE APPLICATIONS AND O/S:** SQL, Oracle, Sybase, SQL Server, Lotus Notes, C, C++, Gupta, Powerbuilder, Smalltalk, Visual Basic, GUI, UNIX, Motif, MUMPS, SAS, OS/2, PeopleSoft, CASE, SDK, OLE, MFC, Oracle Financials, Access, Informix, IMRS, DBS, Paradox, Dynasty, FoxPro, Filemaker, DB2, MVS, Adabas/Natural, SAP R3/R2, ABAP4, IDMS, CICS, IMS/ DB/DC, Forest & Trees, Cobol 1 & 2, AIX, Windows NT, Progress, JD Edwards, Ingres, MSA, EXCELL, Uniface TELON, IEF, SDK, CISCO, Novell, HP-UX, ATM, SQA Robot, Java, HTML, Groupwise, Rogue Waves, DS1, DS3, Delphi, *& much more.*

If you can't attend, mail 1 resume to: Job Expo NW, 36 East 23rd St. 8th Fl. NY, NY 10010

BRING YOUR FRIENDS! Visit us at www.tech-expo.com

Network World's Fall is bursting with Advertising Opportunities

Sept. 1st
Annual
Salary Survey

Sept. 8th
Bonus Distribution:
ICE, Los Angeles

Sept. 15th
Bonus Distribution:
TCA, San Diego

Sept. 29th
N+I Pre-Show Issue
& "BUZZ" Issue

Oct. 6th
Networld + Interop Show Issue
Bonus Distribution of 10,000+ Issues

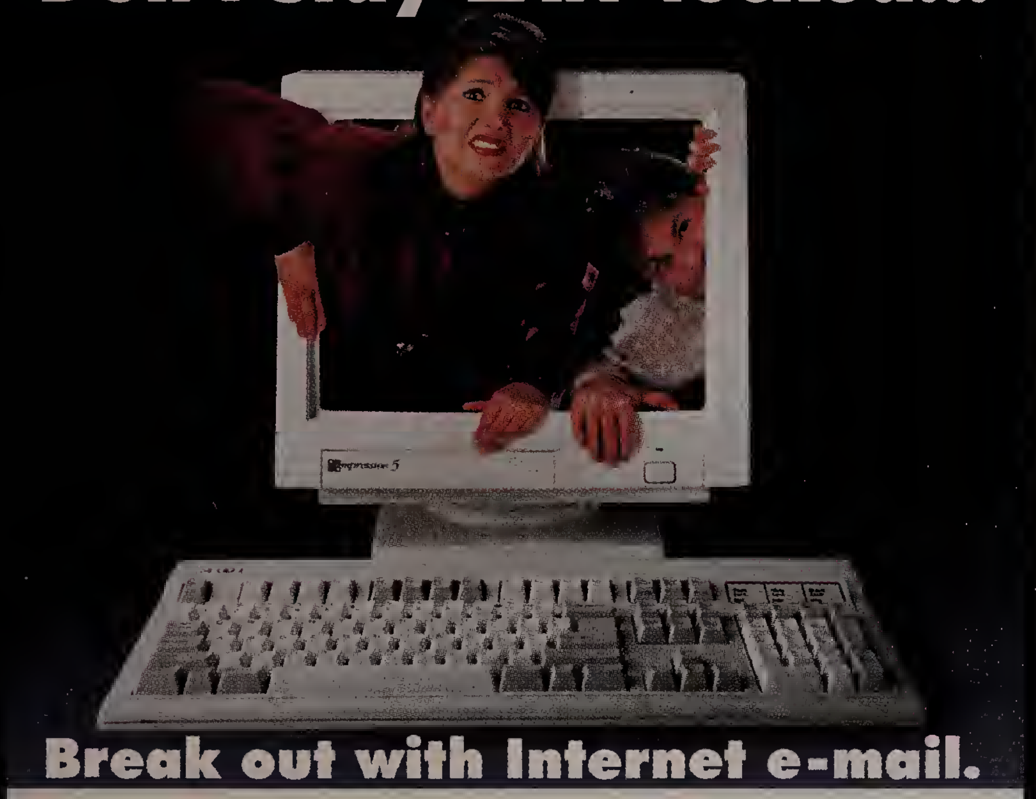
Sept. 22nd
Networld + Interop
Show Planning Guide

Call for more information on placing your ad with Network World

1-800-622-1108

CARLA CAPPUCCI / RECRUITMENT ADVERTISING

Don't stay LAN-locked...



Break out with Internet e-mail.

Forget inter-office boundaries. Whether you use **Lotus cc:Mail, Novell GroupWise, Lotus Notes, MicroSoft Mail or Exchange...** in just minutes, your entire organization can be "connected" with TOLL-FREE, reliable, virus scanned Internet mail capabilities. We'll help set us and configure you system—even register an Internet domain name. Don't be a victim of LAN-lock... Internet mail can be yours easily and affordably. Call us today to set us a free trial account.

1-800-209-MAIL

AllegroNET™
the corporate e-mail authority

info@allegro.net
http://www.allegro.net

The Allegro Group®

Lotus cc:Mail, Novell GroupWise, Lotus Notes, and Microsoft Mail & Exchange are trademarks of their respective companies.

Reader Service No. 303

Marketplace

The Hub of the Network Buy

Free Product Information

To receive more information circle the reader service numbers of products that interest you.

Send this coupon to: Network World P.O. Box 5090, Pittsfield, MA 01203 or Fax (413) 637-4343, or use the prepaid card elsewhere in the issue.

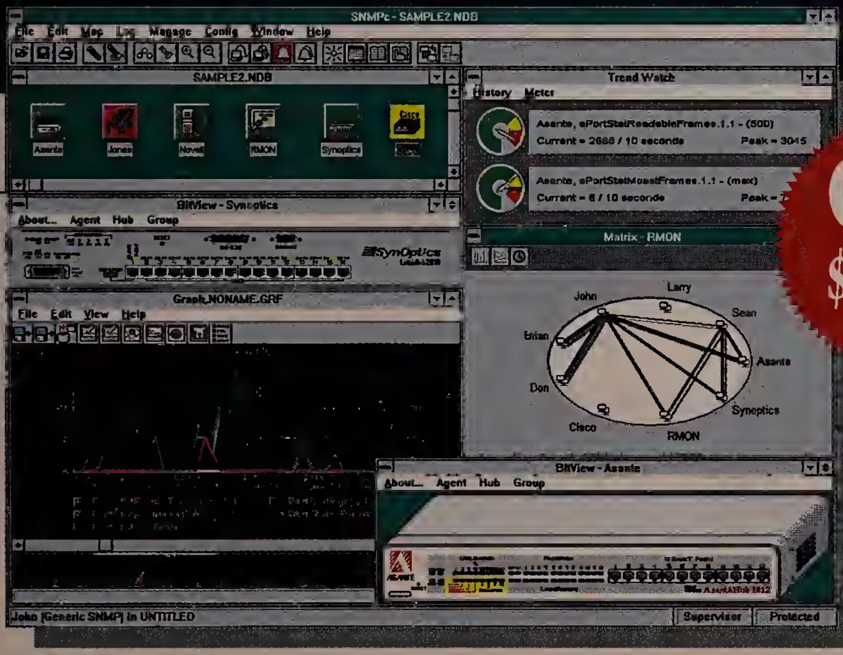
Expires 11/24/97

Name:	217	218	219	220	221	222	223
	224	225	226	227	228	229	230
Title:	231	232	233	234	235	236	237
	238	239	240	241	242	243	244
Company:	245	246	247	248	249	250	251
	252	253	254	255	256	257	258
Phone: ( )	259	260	261	262	263	264	265
	266	267	268	269	270	271	272
Street:	273	274	275	276	277	278	279
	280	281	282	283	284	285	286
City:	287	288	289	290	291	292	293
	294	295	296	297	298	299	300
State: **Zip:**	301	302	303	304	305	306	307
	308	309	310	311	312	313	314

8/18/97

SNMPc

Network Manager for Windows



Only $795

NETWORK COMPUTING EDITOR'S CHOICE

- Full RMON Support
- Integrates with HP OpenView
- TCP/IP, Telnet, TFTP, BOOTP
- WinSNMP/WinSock/DDE APIs
- SNMP, ICMP, IPX Polling
- Node Discovery
- Long Term Statistics/Thresholds
- Custom Event Actions/Forwarding
- Over 100 Device Specific GUIs
- MIB Compiler/Browser

Castle Rock Computing

408-366-6540
Fax: 408-252-2379

Reader Service No. 252

> "To be truly versatile the DACS must first know generosity."
>
> I Ching
> The Book of Migration

The DNX - Digital Network Exchange

Eastern Research's DNX - Digital Network Exchange is a communications platform that addresses today's DACS requirements, yet is capable of supporting the higher speeds and protocols of tomorrow.

This modular DACS Switch can terminate up to 44 interfaces - either T1 with CSU, or high speed data. It then provides non-blocking switching down to the DS0 level.

Major features include:

- Full Redundancy
- SNMP and TELNET Management
- Event Driven Reconfigurations
- Integral Test Access

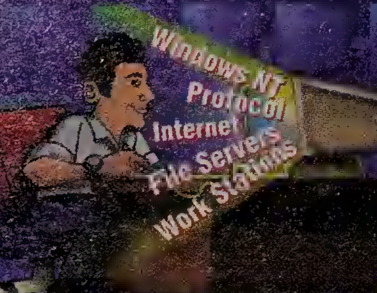
Call us today for more information on all our WAN access and internetworking products.

Eastern Research
Products as Solutions

225 Executive Drive, Moorestown, NJ 08057
1-800-337-4374 609-273-6622 E-mail: info@erinc.com http://www.erinc.com

Reader Service No. 225

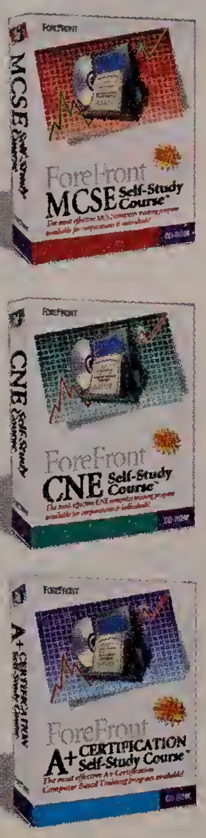
Get MCSE, CNE or A+ Certified ...FAST!



Bonus!!!

Buy any two CBTs at the regular price and get the Micro House Technical Library™ FREE

ForeFront's Self-Study Courses are the first 100% Computer Based Training (CBT) programs on CD-ROM to fully prepare you for Microsoft's MCSE, Novell's CNE and CompTIA's A+ Certification exams.


MCSE Self-Study Course
ForeFront MCSE Self-Study Course
CNE Self-Study Course
ForeFront CNE Self-Study Course
A+ Certification Self-Study Course
ForeFront A+ Certification Self-Study Course

ForeFront's Self-Study Courses give you flexibility and portability unmatched by traditional training methods. You'll study at your own pace using our easy to follow, step-by-step format. Study whenever and wherever it's convenient for you!

The ForeFront Self-Study Courses ensure the highest rate of information retention so that when you complete your training you'll be fully prepared to pass your certification exams. You'll be ready and confident to go into the workplace to effectively do your job whether you've chosen to work as a PC technician or if you work on networks using Windows NT or NetWare.

The ForeFront Self-Study CBTs provide you with fast, effective and convenient training, even if you're hampered by a busy schedule. You'll learn and practice everything needed for full certification in your chosen area.

Getting certified, whether it's for your **MCSE**, **CNE** or as an **A+ Certified Technician**, will help open the way to further advancement in the corporate world. All of ForeFront's Self-Study Courses give you the complete technical material, knowledge, interactive exercises, and confidence you'll need to pass your exams and excel in today's competitive High-tech marketplace!

- **All on one CD**
- **Interactive simulations for hands-on exercises**
- **Study at your own pace**
- **Hundreds of practice questions**
- **Priced below competitive products**
- **Everything you need to prepare for the exams!**

MasterCard VISA AMERICAN EXPRESS DISCOVER /NOVUS

- **Free Technical Support**
- **Next Day Shipping**
- **Performance Guaranteed**

Call for Special Discount Pricing Today!

1-800-475-5831 CODE NWM

(813) 724-8994 • FAX (813) 726-6922

MAXIMIZE YOUR NETWORK'S PERFORMANCE ...FREE!*

NetTUNE®PRO, from BMC Software, Inc. gives you a cost-effective solution to dramatically increase performance for Novell NetWare and Windows NT Server environments. With instant and concurrent monitoring of every server on a wide area network, graphic displays of file server statistics in real time and user-definable historical databases, NetTUNE PRO gives you the power needed to run a network with ultimate efficiency.

- Maximize network performance!
- Eliminate bottlenecks!
- Reduce server downtime!
- Optimize memory usage!
- Manage and schedule events!
- Automatic Resource Optimization!
- Gain more control over your network!
- Customize reports!
- Much, much more!

BMC® SOFTWARE

Call today for a FREE Trial Version!

The NetTUNE PRO product is copyrighted by BMC Software, Inc.

GSA# GS35F4628G

FOREFRONT™ DIRECT

25400 U.S. Hwy. 19 N., #285
Clearwater, FL 33763

Copyright ©1997 ForeFront Direct, Inc. All Rights Reserved. ForeFront CNE Self-Study Course, ForeFront A+ Certification Self-Study Course and ForeFront MCSE Self-Study Course are trademarks of ForeFront Direct, Inc. The NetTUNE PRD product is copyrighted by BMC Software, Inc. The ForeFront Logo is a trademark of the ForeFront Group, Inc. All other trademarks are the properties of their respective holders. ForeFront Direct, Inc. is a subsidiary of ForeFront Group, Inc.

NWM

Reader Service No. 237

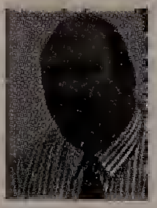
TAKE Control

of 2 to 64 computers

MasterConsole

Managing Multiple Servers?

Save time, space and money! Raritan's MasterConsole will give you rock-solid, reliable control of all your systems— **PCs, Macs, Suns**—from a single keyboard, monitor and mouse. Tens of thousands of organizations rely on MasterConsole every minute of every day. So can you!



"We've installed hundreds around the world. They just don't break. Nothing else compares."

Dan Desmond
President
Advanced Networks

Raritan (800) RCI-8090 x19

Raritan Computer, Inc.
400 Cottontail Lane,
Somerset, NJ 08873

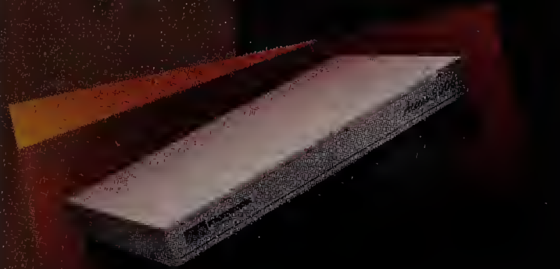
E-mail: sales@raritan.com
http://www.raritan.com

Tel. 908.764-8886
Fax 908.764-8887

IS Expo Fall '97
Philadelphia PA
Sept 15-16
Booth #106

Reader Service No. 314

TOTAL ACCESS SOLUTION



The Access 9000 is a modular Remote Access Router, X.25 PAD/Switch, and Terminal Server all rolled into one cost effective platform.

Basic Configuration
- Two T1/E1 sync ports
- Ethernet port
- Console port

Optional Add-on Cards
- Two 8-port cards supporting async and sync on any port
- ISDN BRI card

Applications
- Internet PPP terminal server access via dial-up async
- ISDN BRI access to the Internet or dial backup
- Remote dial-up access to Corporate LANs
- Robust X.25 PAD/Switch functionality
- IP routing - OSPF, RIP, RIP2
- Frame Relay networking/X.25 over Frame Relay

Call us today to discuss your particular application or check out our Web site.

microtronix

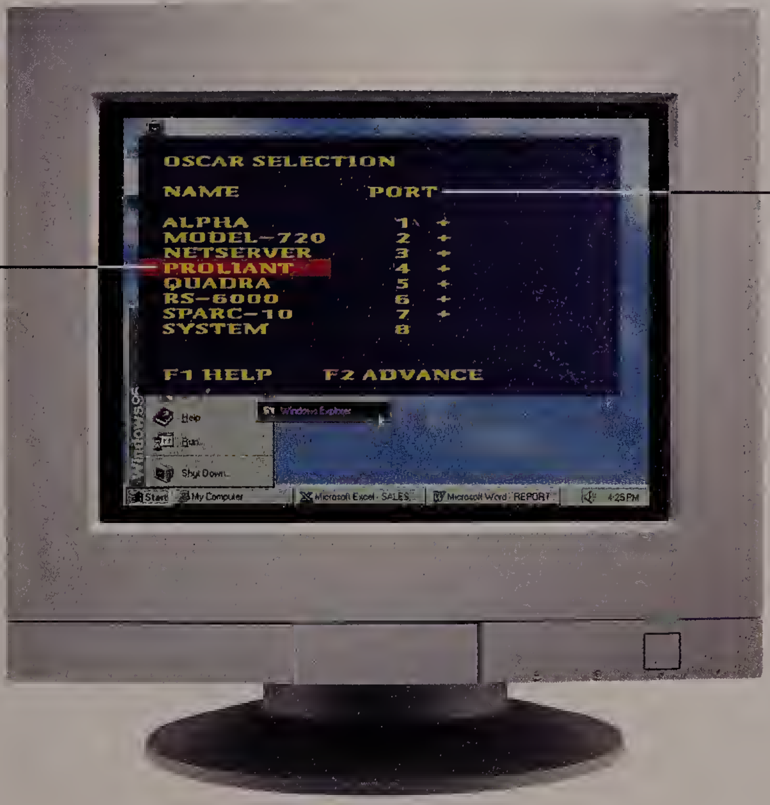
200 Aberdeen Drive
London, Ontario N5V 4N2
CANADA
Tel: (800) 404-2748 or
(519) 659-9500
Fax: (519) 659-8500
Email: info@microtronix.com
Home Page:
http://www.microtronix.com

Let us design an Access 9000 to fit your n

Reader Service No. 263

Suddenly, everybody's switching.

Now with mouse control and password security!



OSCAR SELECTION

NAME	PORT
ALPHA	1
MODEL-720	2
NETSERVER	3
PROLIANT	4
QUADRA	5
RS-6000	6
SPARC-10	7
SYSTEM	8

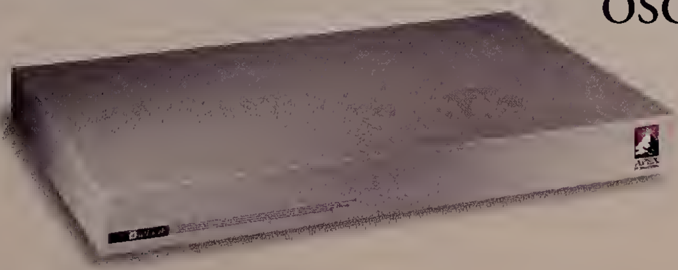
OSCAR's user-definable system nomenclature lets you name servers anything you want, for a more intuitive sense of what's happening where.

View 8 systems - or use the mouse to scroll down to see up to 100*!

Get cross-platform keyboard, mouse and monitor switching on-screen—instantly!

Introducing OSCAR™, the industry's first on-screen menu system offered on all switching systems from Apex PC Solutions, Inc.

OSCAR (On-Screen Configuration & Activity Reporting) allows you to select and control all the systems in your data center with a simple click of the mouse. Using a single keyboard, mouse and monitor, OSCAR lets you access a wide range of hardware such as RS-6000®, Macintosh®, SUN® and HP-9000®. Then quickly view current information and direct system connections.



With mouse control, OSCAR offers switching at your fingertips.

See it all - just the way you want.

OSCAR's intuitive, menu-driven commands take you wherever you want to go, in your terms. Now, you can input system names that make sense to you right on the screen. So you can switch platforms and applications at the stroke of a key or click of your mouse.

Discover control you can count on.

OSCAR firmware is installed in all Apex PC Solutions products. With Apex's new password security, OSCAR adds one more level of protection to your data applications.

Discover why everybody's switching to Apex PC Solutions, Inc. Call us today **1-800-861-5858 or (425) 402-9393.**

**when using SunDial™*

Innovation & Technology by Design

APEX™
PC SOLUTIONS

Apex PC Solutions, Inc. • 20031 142nd Ave. NE • Woodinville, WA 98072
fax (425) 402-9494 • e-mail sales@pcsol.com • http://www.apexpc.com

© 1997, Apex PC Solutions, Inc. All rights reserved. OSCAR and SunDial are trademarks of Apex PC Solutions, Inc. in the United States and certain other countries. All other trademarks are the property of their respective owners.

Reader Service No. 251

lets you do **more,**

do it **better,**

do it for **less!**

Announcing the **AutoView Commander**;
the keyboard/video/mouse switch with all the right stuff!
More ways to select attached servers with convenient on-screen menus, traditional Cybex push-buttons or a quick keyboard sequence.
Better design for easy reconfiguration without powering down the switch or attached servers. And best of all ... it costs **less** than many comparable switches. Now that's good stuff.
One Company. One Solution. Cybex.

INTEROP
OCT 8-10
BOOTH #3945

CYBEX

4912 Research Drive Huntsville, Alabama 35805 USA
(800) 93CYBEX (29239) • (205) 430-4030 fax
http://www.cybex.com

MICROSOFT WINDOWS NT COMPATIBLE · Yes NetWare. · BANYAN · LANtastic Compatible

AutoView is a trademark of Cybex Computer Products Corporation. Cybex is a registered trademark of Cybex Computer Products Corporation.

Reader Service No. 227

WHO SAYS??

"Network Monitors are BIG and Expensive."
Apparently they haven't heard....

POCKETWatch
Pocket Protocol Analyzer

Puts the POWER of
LANWatch®
in the PALM of your HAND
for UNDER $1500

Consider the convenience of a network analyzer that fits in your pocket, goes everywhere you need to go, and runs on 2 AA batteries for over 7 hours!!

POCKETWatch
For the SERIOUSLY Busy Network Professional

PRECISION Guesswork
Five Central Street, Topsfield, MA 01983
(508) 887-6570 (phone)
(508) 887-6552 (fax)
http://www.guesswork.com
Email: info@guesswork.com

Hewlett Packard is a trademark of the Hewlett Packard Company

Reader Service No. 254

GNAT Box

2.0 Version Now Available

The Simple, Powerful & Affordable
Firewall

- Proven Firewall Technology
- Network Address Translation
- Unlimited User License
- High Performance
- Transparent Network Access
- Easy to Configure & Use
- Remote Web Based Management
- Minimal Hardware Requirements
- Ideal for Intranets
- Cost Effective

$ 995.00

NCSA CERTIFIED

1-800-775-4GTA
Web: http://www.gnatbox.com
Email: gb-sales@gta.com
Tel: +1-407-380-0220 Fax: +1-407-380-6080

Global
Technology
Associates, Inc.

Reader Service No. 292

"I'm using it to control critical router connections, monitor DSU-T1 links, and troubleshoot the 50 Frame Relay lines we added last month.

As my network evolves, I rely even more on GS Networks' 2700 Switch."

Can matrix-based switching make a critical difference in your data center?

Only if monitoring router-to-DSU connections without disrupting service is important.
Only if finally knowing what's happening in the far reaches of a frame relay network is important.
Only if controlling large-scale WAN and LAN configurations from anywhere in the world is important.
Only if bypassing a failed communications port so that business-critical data keeps flowing is important.
Only if enabling the entire operations staff to work more productively is important.
Only if having the security of full-time alarming on the network's physical layer – where 50% of downtime still occurs – is important.
And only if the switch is the incomparable 2700 from GS Networks, the world leader in matrix technology.

Contact GS Networks today and we'll tell you how network professionals in the most demanding industries are relying more than ever on the 2700's matrix-based connectivity and test access solutions.

The 2700 Switching System:
When Every Connection Counts

www.gsnetworks.com

GENERAL SIGNAL
Networks

General Signal Networks, Inc.
13000 Midlantic Drive
Mount Laurel, New Jersey 08054

Phone: 609-234-7900 800-222-0187
Fax: 609-778-8700

Circle Reader Service #265

Let's Talk TurnKey!

Total Storage & Systems Solutions

DVD Drives Now Available!

- Plug & Play Mass Storage Networking
- Compatible with ALL Major Operating Systems
- Hard Drive RAID Systems
- Latest and Fastest CD-ROM Drives
- Customizable Drive Arrays
- Jukeboxes
- Remote Access Systems
- Internet/Intranet/Extranet Servers
- Networking Software
- CD Writers/Duplicators/Media
- Available under GSA Contract
- Toll-Free Technical Support

TODD ENTERPRISES INC.
(800) 445-TODD (8633)
In NY: (516) 777-8633 • In DC: (301)577-0894
FAX (516) 777-2750 • http://www.toddent.com

Direct Partners with Major Manufacturers:

yes It runs with NetWare

adaptec JVC Microsoft MITSUI NSM OPTI-NET® Panasonic PIONEER® PLEXTOR SMART STORAGE Stac TOSHIBA YAMAHA®

Reader Service No. 266

Breakthrough

In Keyboard Monitor Switches

Multi Platform & On-Screen Display

SEE US AT NETWORKS EXPO
September 9-11, Dallas, TX
Booth #1579

BREAKTHROUGH the clutter of multiple keyboards, monitors, and mice with this latest **INNOVATION** from Rose. This switch has every feature you asked for:

Switches several servers or computers to a single monitor, keyboard, and mouse

Supports any mix of PC, Apple, Sun, RS 6000, HP 700 series, DEC Alpha, SGI, or other computers from any keyboard or mouse

Front panel has keypad for easy selection of computers and configuration

Front panel display shows computers name and other information

Command to switch can come from your keyboard, front panel, or RS232 port

Simple to use keystrokes switch computers for fast and easy control

Built in daisy-chaining supports up to 256 computers

Flash memory for future upgrade of features

Easy to use OverView™ system gives control and status with on-screen graphics

Many other features!

CALL FOR A FREE CATALOG:
- *Keyboard/Video Control*
- *Print Servers*
- *Data Switches*

800-333-9343

VISIT OUR WEB SITE AT WWW.ROSEL.COM

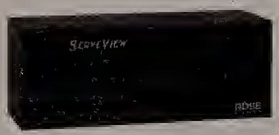
ROSE ELECTRONICS

10707 STANCLIFF ROAD HOUSTON, TEXAS 77099 TEL 281-933-7673 FAX 281-933-0044

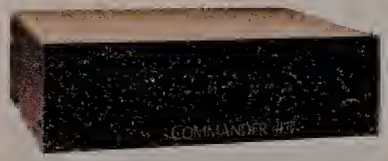
Reader Service No. 289

Keyboard/Video & Mouse Switches

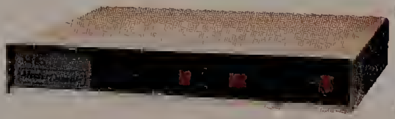
KVM Switches do much more than just switch user peripherals. But, with all the products on the market today, which system will be the best solution for your company?



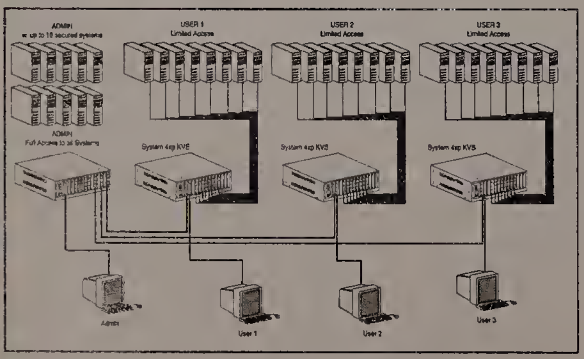
THE SMART CHOICE IS TRON.



Let experienced technicians take you through the Keyboard/Video Switch maze of vendors and products. We introduced the technology to you in our Industry Standard Keyboard/Video Switch (KVS) White Paper. Tron uses and test KVMS products in our own offices and labs, so we can provide better service to our buyers.



Where each vendor promotes their own product, Tron will give you a complete comparison of several products all at once. Give yourself complete control over your data center and how it's personnel operate with the products that are right for your application. We'll assist in your selections and explain system enhancements using Extender/Expander products.



This KVMS System design was configured by our technicians using the 4xp system from Cybex. Multi-User products are also available from Rose and Apex PC, and our experience with KVMS makes Tron the only supplier that can design a completely pre-tested multi-vendor KVMS system.

(800) 808-4672
Ask for a FREE KVMS White Paper
Or, download it from our internet site @www.tron.com

TRON INTERNATIONAL, INC.

Reader Service No. 233

ATM

The Facts
The Products
The Players

It's all here. All in one place. Mier Communications' totally revised and updated 400-plus page Special Technology Report on ATM. Includes a special section on ATM test equipment.

Call: 1-800-MIERCOM ☎ 609-275-7311
E-Mail: info@mier.com

Mier Communications, Inc.
[illegible] Hightstown Road, Princeton Junction, [illegible]
[illegible]

VISA DISCOVER MasterCard

Reader Service No. 288

Affordable 10/100/1000Mbps

10/100 Network Cards

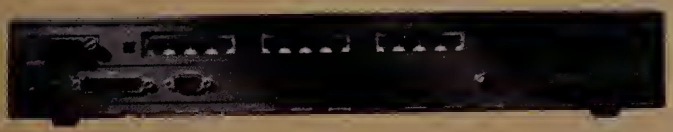
3COM Fast EtherLink XL PCI Adapter
Delivers the highest performance at 10/100Mbps, revolutionizing network connectivity.
(3C905-TX) Single/5Pk/20PK $85/410/1,600

INTEL PRO/100 TX PCI Adapter
When connected to a switch, this 10/100 adapter will auto-negotiate, full-duplex. (PILA8465B). .$70/340/1,183

Hubs

3COM SuperStack II Dual Speed 10/100 Hub
Autosensing ports allowing a simple economical migration from shared 10Mbps to 100TX.
(3C16590)........ $1213 (3C16591) $1917

BAY NETWORKS BayStack 100BASE-T Stackable Hub
Delivers 100Mbps connectivity with 12-ports for power workgroups. (AT2202001) $1,350



D-LINK Standalone Desktop Hub
Provides 8 100Base-T ports for connecting a small workgroup to a high bandwidth network.
(DFE-808TX) $406

D-LINK Stackable Desktop Hub
Provides 12 Fast Ethernet ports.(DFE-812TX) $775

INTEL Express 10/100BASE-T Stackable Hubs
Delivers 10/ 100 Mbps connectivity for powerful PCs, servers, and workgroups.
12-Port 100BASE-TX (EE110TX12) $1099

NBASE MegaStack 100 - Fast Ethernet Hub System
A 100Base-TX/FX stackable hub brings Fast Ethernet to bandwidth-intensive applications.
12 100Base-TX Ports (NH1012) $1,300

Switches

3COM SuperStack II Desktop Switch
Designed to connect users directly to a dedicated 10Mbps port, 24-ports/1 user per port.
(3C16902) $1534

3COM SuperStack II Switch 1000
The Switch 1000 provides 12 switched Ethernet ports and one 100BASE-T port. (3C16901A) $1692

3COM SuperStack II Switch 3000
12 switched 100Mbps Ethernet ports with 1 MDA slot
(3C16942A) $2,280

BAY NETWORKS BayStack 301
This Desktop Ethernet Switch offers 22 10Base-T and 2 100Base-TX ports as a cost-effective desktop switching solution. (CW2001001) $2,499

BAY NETWORKS BayStack 28115R/ADV
A Fast Ethernet Switch with 16 RJ-45 ports for supporting 10/100Mbps. (28115R) $6,625

BAY NETWORKS 2216T Switch
16 10BaseT ports and one 100TX port.
(DF1901001) $1325

BAY NETWORKS BayStack 350T
Autosense Switch 16 10/100 Autosensing ports. Operate in either half or full Duplex.
(AL2012E01) $2590

BAY NETWORKS BayStack 28200
Modular 4 Slot Chassis. (28200) $1700

CISCO Catalyst 1900 Switch
24 switched 10Base-T ports and choice of 2 100Base-TX/FX switched ports. (WS-C1900) . . .$3,031

D-LINK DES-3205
5 switched auto-negotiable 10/100Mbps ports and 1 expansion slot. (DES-3205T) $1720

INTEL Express 10/100 Switch
8 10/100 ports plus two slots for adittional 4 100Base-TX ports. (ES101TX) $2167

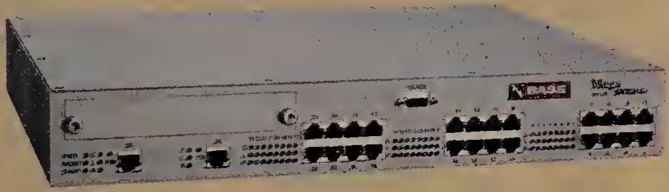
NBASE MegaSwitch EZ
Connect 100Mbps to 10Mbps Workgroups. Expands network distance up to 100 km with fiber.
2-Port 10/100 Switch (NH2001-TP) $660

NBase MegaSwitch 100
The MegaSwitch 100 is a Fast Ethernet switch with 5 100Base-TX/FX ports and 2 slots for additional 100Base-TX/FX ports. (NH2007) $1,996
(NH200FO/M) 5 FX ports $3,754

NBase MegaSwitch II 10/100/1000
The only 10/100 auto-sensing switch with 8-12 ports and 2-slots to offer Fiber up to 110Km, ATM, and Gigabit Ethernet -- All in one box. (NH2012) $2,900

2-Port 100BASE-TX Module (NH2002MP) $1,270
2-Port 100BASE-FX Module (NH2002FO/M) $1,635
Gigabit Ethernet Module (NH2002/GE/M) $2,495
8-Port 100Mbps Switching Module (MP2008MP) ..$900

NBase MegaSwitch G 10/100 Workgroup Switch
Highly integrated ASIC technology, coupled with a Gigabit/sec backplane, the MegaSwitch G has 16 10 Base-T ports with optional 2 10/100 ports.
(NH218-10) $1,950



NBASE MegaSwitch 228 (24+2+2)
Offers 24 switched 10BaseT Ports, plus 2 auto-sensing 10/100 ports plus an optional dual 10/100 TX or FX uplink. (NH228-10) $2,330

Routers

ASCEND Pipeline 75
Unlimited users, 2 POTS, ISDN bridge with IP/IPX routing, compression, and built-in NT1. (P75-1UBRI) $665

ASCEND Pipeline 130
PIPELINE 130 Router ISDN BRI, V35 WAN port, built-in NT1, IP/IPX (P130-UBRI-V35) $1339

CISCO 2501 IP Router
1 Ether port/2 serial ports with IP software.
(Cisco2501-CH) $1,760

CISCO 2503 ISDN IP Router
1 Ether port/2 serial ports with 1 ISDN BRI.
(Cisco2503- CH) $2370

CISCO 2509 Router
1 Ether port/2 serial ports/8 Asynchronous ports.
(Cisco2509- CH) $2,206

CISCO 776
ISDN Access Router including NT1, 2 pots, and 4 port hub. (Cisco776-CH) $743

CSU/DSU

ADTRAN T1-FT1
CSU/DSU expandable, V.35 and RS530
(1200052L1) $1159

ADTRAN TSU-T1
Single port T1/FT1 CSU/DSU V.35 (1200060L1) ..$852

Call for Current Pricing on Any Manufacturer's Products

1-800-FOR-LANS
1-800-367-5267

WEST HILLS LAN SYSTEMS

7949 Woodley Avenue, Van Nuys, CA 91406
Technical Support: 818-773-8171
Fax: 1-818-773-8932

Visa/MasterCard/Discover/American Express • Fast Delivery • Most Orders Ship The Same Day • Prices Subject To Change Without Notice

Circle Reader Service #297

In Charge of Network Security?

You need Interceptor™ Firewall Appliance from Technologic - your single source for Internet security.

The basic features you need: Protect from hackers. Control Internet access. Manage usage. And the technology to back it up:

- *Secure Remote Management*
- *Graphical Reporting*
- *Security Scanning*
- *Virtual Private Networking (VPN)*

SECURE. Bullet-proof security backed by leading-edge technology.

VALUE. The leading value with prices starting at $3495 including hardware and software.

Can your network keep a secret?™

FREE. Call today for a free demo and information

800•615•9911 www.tlogic.com

Technologic
Can your network keep a secret?™

CERTIFIED

GENUINE RSA ENCRYPTION ENGINE

S/WAN ENABLED

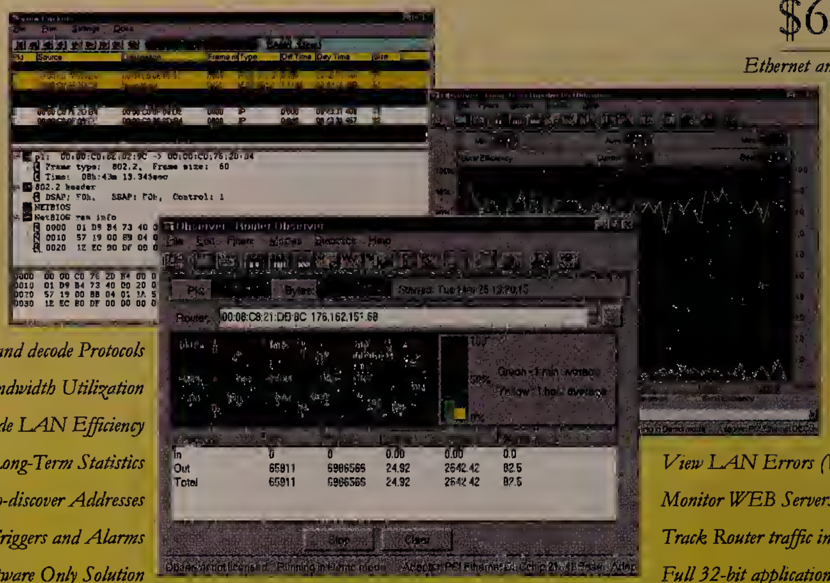
©1997 Technologic. "Can Your Network Keep a Secret?" and Interceptor are trademarks of Technologic.

Reader Service No. 223

A SOFTWARE ONLY 32-BIT NETWORK ANALYSIS APPLICATION

SO FULL OF FEATURES, YOU WON'T BELIEVE THE PRICE

$695.
Ethernet and Token Ring



Capture and decode Protocols
Monitor Bandwidth Utilization
Grade LAN Efficiency
Track Long-Term Statistics
Auto-discover Addresses
Set Triggers and Alarms
Software Only Solution

View LAN Errors (Vital Signs)
Monitor WEB Servers
Track Router traffic in real time
Full 32-bit application (95/NT Only)

OBSERVER™ 4.0

If you have network slowdowns, would you know if they were due to overloaded bandwidth, broadcast storms, or errors? Observer will show your LAN traffic in real time, and with this information, pinpoint problems. Once the source and cause is found, solutions and action plans become clear. Start seeing what you have been missing! Call 800-526-7919 for a FREE DEMO or download from our web site.

www.networkinstruments.com

NETWORK INSTRUMENTS

© 1997 Network Instruments, LLC - Corporate Headquarters (612) 932-9899 FAX (612) 932-9545, UK and Europe +44 (0) 1474 702427 FAX +44 (0) 1474 707830 Internet: info@networkinstruments.com www.networkinstruments.com Observer™ and Analyst/Probe™ are trademarks of Network Instruments, LLC Minneapolis, MN USA

Reader Service No. 290

GET FLEX with ASCEND

MAX 4048 with K56Flex Technology Available Now – Call for Special ISP Pricing

The **MAX 4048** is specifically designed for two T1/PRI operations and features Ascend's new Series56 digital modems. This high-performance, RISC-based product delivers more features and better price-per-port than anything else in its class.

Call for info on FREE upgrades for MAX products purchased after November 1, 1996!

AVAILABLE NOW!

The **MAX TNT** is the only WAN access switch that concentrates both dial-up and dedicated traffic in a single platform, providing unprecedented capacity at a breakthrough price.

The **GRF 400 IP Switch** is specially designed to handle network growth while providing consistent high performance, regardless of the dynamics of the network. The GRF 400 was awarded **1997's Product of the Year** by *Network Magazine*.

AVAILABLE NOW!

ADDITIONAL ASCEND PRODUCTS:

P50-1UBRI	Pipeline 50	ISDN, built-in NT1	$595.00
P75-1UBRI	Pipeline 75	U Interface	$655.00
P130-UBRI-FT1	Pipeline 130	w/T1/FT1 & BRI	$1,396.00
MX-18BRIU	MAX 1800	Eight BRI U Interface	$4,900.00
MX20-1T	MAX 2000	One PRI/ISDN soft	$6,187.50
MXHP-4T1-4	MAX 4004 base chassis with Four T1		*
MXHP-2T1-2	MAX 4002 base chassis with Two T1		*

*call for special ISP pricing

ASCEND Remote Networking Solutions That Work.™

SOLU
SoluMan and Router – Heroes of NETropolis!

SOLUNET
Nothing But NETworks

1-888-SOLUNET
FAX 407-676-0809
SALES@SOLUNET.COM
WWW.SOLUNET.COM

Reader Service No. 298

Travel light with the portable ATM•WAN•LAN Protocol Analyzer

ATM • WAN • LAN
The PrismLite™
will test them all
at the same time!
Legacy LAN attached servers
ATM/LAN switch with LAN Emulation
ATM switch
ATM attached high-end servers with LAN Emulation

RADCOM

Phone: 1-800-RADCOM-4 201-529-2020 Fax: 201-5[illegible]08
E-Mail: 74777.3702@compuserve.com Web Site: http://www.radcom-[illegible]

Reader Service No. 295

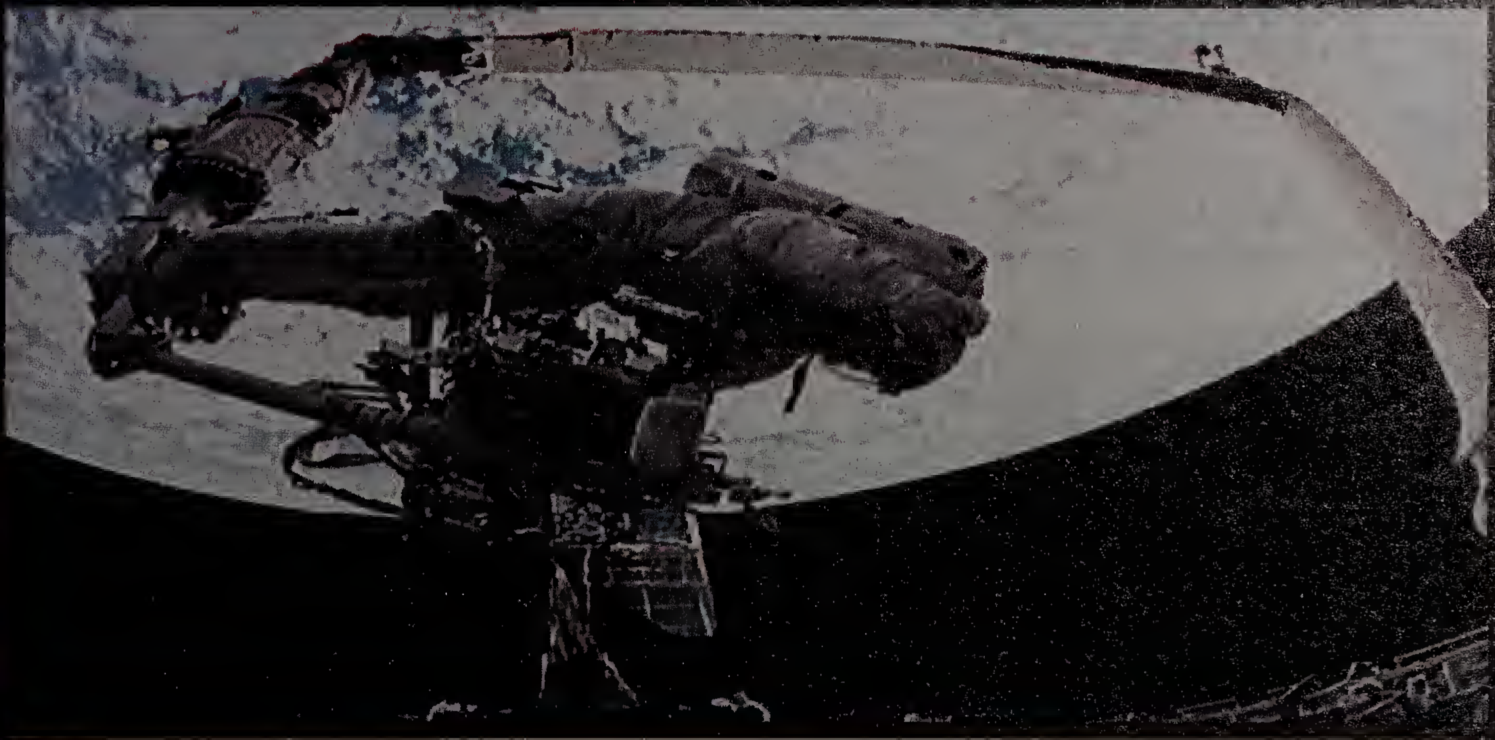
PRODUCT REVIEW

Wouldn't it be nice to have one product for all your remote control requirements? With NetSupport for Windows and OS/2, you can reach any Windows 3.1X, Windows 95, Windows NT, OS/2 or DOS PC from the comfort of your own desktop. View the remote screen, control it's keyboard and mouse, transfer files back and forth. All done across your LAN or WAN (NetBIOS, IPX, TCP/IP) or via dial up (modem, ISDN).

NetSupport for Windows and OS/2 offers the Speed to remote control your workstations, regardless of screen resolution. It interacts with the operating system using as few resources as possible. Highly efficient compression ensures great performance and security even across slower WAN or dial up links.

NetSupport for Windows and OS/2 provides the ease of use needed in a remote control product. Easy to install, easy to configure and very easy to use. Browse feature scans the network and presents a list of available PC's. One click, and you are connected. Allowing you to establish a remote control sessions, open a chat box or transfer files regardless of operating system on either PC. With NetSupport, you will feel right at home. NetSupport is available exclusively through Markham Computer Corporation.

The POWER to Remote Control a Single PC or Your Entire Network Any Where! Any Time!



Windows NT, Windows 95, Windows 3.x, OS/2 or DOS

Features include:

- Watch, Share or Control any other PC's
- Lan, Dialup and Gateway all-in-one
- Show Control Screen to one or many Clients
- Advanced Modem Diagnostics for trouble free installation
- Sophisticated "Drag and Drop" File Transfer
- Chat On-Line to users
- Send messages to one or many PC's
- Control any platform simultaneously
- Supports higher and lower resolutions on client PC's simultaneously

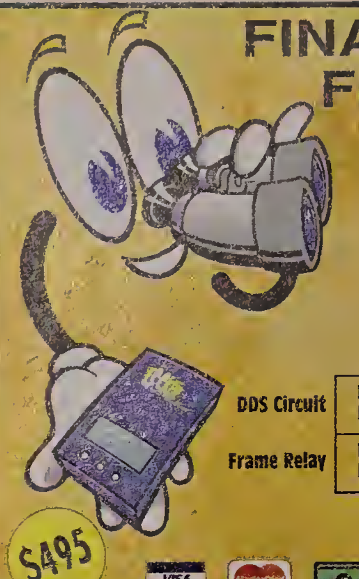
MARKHAM C·O·M·P·U·T·E·R CORPORATION

1-800-262-7542

E-Mail: Info@mcc-usa.com, WEB: www.mcc-usa.com
Tel: 561-394-3994, Fax: 561-394-3844

All logos, names or products are property of their respective owners. Windows is a trademark of Microsoft Corporation

Reader Service No. 228



FINALLY!
Frame Relay
Made Easy!

- Reduce installation time and cost.
- Eliminate troubleshooting guesswork.
- Decrease network downtime.
- Non-frame relay DDS lines too!

DDS Circuit	Ready/ Not Ready	Data Rate	Line Quality	Network Test Detect
Frame Relay	Ready/ Not Ready	Link Management	Network DLCIs	Network Test Detect

LOOKER™ by HTCOMM.

$495

VISA MasterCard On-line orders: www.proteld.com 4480 Shopping Lane, Simi Valley, CA 93063 (888) HT LOOKER

Reader Service No. 229

3COM, CISCO, CITRIX, CUBIX, DIGITAL PATHWAYS, EICON, MICROSOFT, PEOPLESOFT, SAP, SDI, SHIVA, US ROBOTICS, WYSE,

ATI Async Technologies, Inc.

REMOTE ACCESS = CONFUSING? For over six years, ATI has specialized in integrating, installing and supporting ONLY remote access servers.

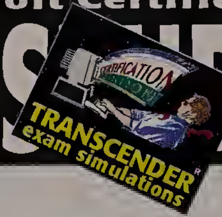
For **FREE CONSULTING** call;

Detroit, MI: (810) 738-8308
Charlotte, NC: (704) 676-0020
Indianapolis, IN: (317) 845-9147
Chicago, IL: (847) 605-8320
Cleveland, OH: (216) 520-0031
Ft. Lauderdale, FL: (954) 938-9844
Cincinnati, OH: (513) 891-0033

Reader Service No. 242

What does it take to get Microsoft® Certified?

STUDY STUDY STUDY



Get the certification that matters.

If your company is among the many using Windows NT®, then Microsoft certification is the best way to assure technical proficiency.
Transcender gives you timed, predictive simulations of Microsoft certification exams.

If you use Transcender, you'll pass the Microsoft certification exam or we'll give you your money back.*

We offer 13 exams for the Certified Systems Engineer track, as well as 7 for the Certified Solution Developer track. ***Visit our Web site for FREE demos and complete product info.***

Call 615.726.8779 FAX 615.320.6594 * Conditions apply. See our Web site for details.

Transcender® Corporation
242 Louise Ave
Nashville, TN 37203

WWW.transcender.com

Microsoft® SOLUTION PROVIDER

Reader Service No. 222

FREE INFORMATION FREE INFORMATION FREE INFORMATION FREE

FREE Product Info

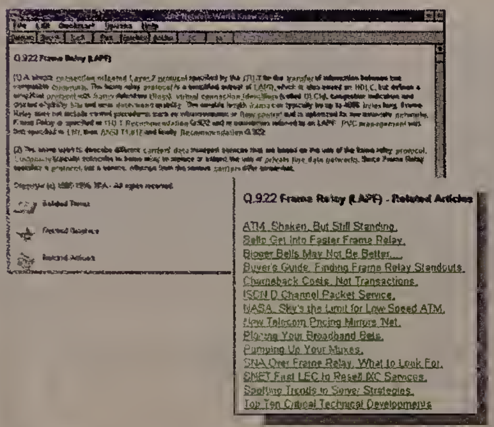
Remember to fill out your Reader Service Card in this issue!

GET IN THE KNOW

The Know Zone™ is Network World's all-new interactive glossary of networking and communications terms. You'll get clear descriptions of technical terms, comprehensive explanations of acronyms and a fast and reliable escort through the techno-babble jungle.

The Know Zone comes jam-packed with:

- Over 2,500 expertly-defined terms, plus their acronyms
- Hypertext / Full-color Hypergraphics throughout, with almost 30,000 hyperlinks
- Thousands of links to related Network World articles
- Immediate access to a vast library of information
- Annotate and bookmark capabilities for complete customization
- Runs on Windows or Macintosh



Q.922 Frame Relay (LAPF)

Q.922 Frame Relay (LAPF) - Related Articles

ATM, Shaken, But Still Standing.
Bells Get Into Faster Frame Relay.
Bigger Bells May Not Be Better....
Buyer's Guide, Finding Frame Relay Standouts.
Chargeback Costs, Not Transactions.
ISDN D Channel Packet Service.
NASA, Sky's the Limit for Low Speed ATM.
New Telecom Pricing Mirrors Net.
Placing Your Broadband Bets.
Pumping Up Your Muxes.
SNA Over Frame Relay, What to Look For.
SNET First LEC to Resell IXC Services.
Spotting Trends in Server Strategies.
Top Ten Critical Technical Developments

SO GET IN THE KNOW!

Get The Know Zone today for only **$49!**

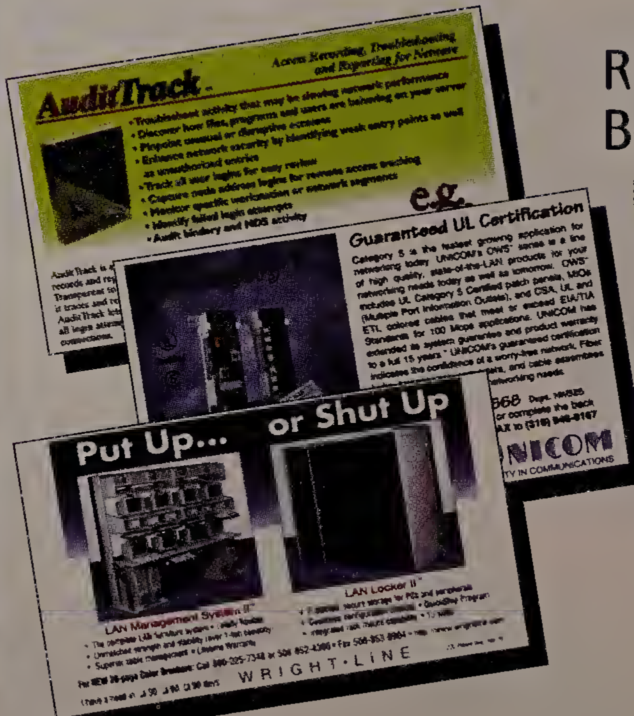
THE KNOW ZONE

Call **800-643-4668** or **508-820-7493** to order!

Reader Service No. 247

Network World's Direct Response Card Decks Deliver

150,000 Qualified Buyers!



Recipients are Buyers of:

internet & intranet products
computer hardware
software
WANs
services
LANs
data/voice equipment
internetworking products
and more!

Call for more information on how to reach these buyers of your products!

800-622-1108 ext. 507

NETWORK HARDWARE

ROUTERS • DSU/CSU • HUBS
TERMINAL SERVERS • SWITCHES

BUY/SELL/LEASE

CISCO

LIVINGSTON • ADTRAN • ADC/KENTROX
BAY NETWORKS • 3COM • CISCO

800-230-6638

VISA Fax: 805-964-5649 MasterCard

http://www.networkhardware.com

NETWORK HARDWARE RESALE, INC.
6445 CALLE REAL, SUITE B • SANTA BARBARA, CA 93117

Circle Reader Service No. 244

SAVE 50% & MORE ON MOST PRODUCTS

BUY/SELL/NEW/USED

VISA **RENT** MasterCard

Reconditioned With Warranty

Multiplexers • T-1/E-1
CSU/DSU's • Channel Banks

CSU/DSU, ALL RATE, V.35/RS232	$99
Newbridge Channel Banks	$2800
Micom Marathon 1K,5K,5K Turbo,10K	50% off
Routers (NEW!)	$895
Kentrox T-Serv II	$450
T-1 CSU's	$250
Telco Systems Channel Banks	$2800
Newbridge 3600 Modules	CALL
T-1 CSU w/Drop/Insert NEW	$995
Stat Muxes 4, 8, 16, 32, port	LOW
T-1 CSU/DSU V.35	$495
Fraction/Full T-1 CSU/DSU	$595
Channel Bank Rentals	$199/mo

METROCOM

THE SUPPLIERS' SUPPLIER
(800) 364-8838 or (281) 495-6500
FAX (281) 495-8449 24 HRS
HTTP://www.MetrocomInc.Com

Circle Reader Service No. 220

Livingston US Robotics
Ascend Micom

CISCO, BAY NETWORKS, CABLETRON, SYNOPTICS,

Specialist in all Cisco products including Memory

LAN/WAN Products

New, Used, Lease, Rent

3Com Codex
Adtran Xylogics
Motorola Wellfleet

We carry all Manufacturers

Millennium Solutions Group, Inc.

- Routers, Bridges
- DSU/CSU's
- Switches, ATM
- Frame Relay
- Hubs, Modems
- Voice over Data

We Buy and Sell
888-801-2001 Fax (916) 797-9997
Visit our Web Site at:
http://www.millenniumsolutions.net

Circle Reader Service No. 293

MICROSOFT NT - v4.0

NT Server - 5 Clients	$445
NT Server - 10 Clients	$575
NT Server - 20 License	$295
NT Workstation-Single	$175
NT Workstation-License	$99
MS Office Std '97	$189
MS Office Pro '97	$238
MS Back Office v 2.5	$1595
MS B/Office 5 User Lic	$895
MS B/Off. 20 User Lic	$1045
MS SQL Server 5 User	$895
MS SQL Ser. 5 User Lic	$445
MS SQL Ser. 20 User Lic	$1045

UPGRADES UP TO 60% OFF

Call on your Network needs, we will compete!!!

GROUPWISE 5.1

5 User	$295
10 User	$495
25 User	$1295
50 User	$2695
100 User	$4995
250 User	$11,995

**Qualification Required*

NOVELL - UPGRADES

v4.11 - 5 User	$325
v4.11 - 10 User	$540
v4.11 - 25 User	$715
v4.11 - 50 User	$955
v4.11 - 100 User	$1295
v4.11 - 250 User	$1995
v4.11 - 500 User	$2495

NOVELL - RETAIL

v4.11 - 5 User	$595
v4.11 - 10 User	$1195
v4.11 - 25 User	$2195
v4.11 - 50 User	$2995
v4.11 - 100 User	$3995
v4.11 - 250 User	$6995

Gov't/Schools P.O.s Welcome Educational Discounts

SAFE SYSTEMS
Tel: 800-399-2808
Fax: 310-246-9646

Circle Reader Service No. 296

USED CISCO DIRECT

NETFAST

Save up to 80% on new/used:
➤ Routers ➤ Switches ➤ T1 CSU/DSUs ➤ Hubs
➤ ISDN/ATM ➤ Frame Relay ➤ Modems

CISCO SYSTEMS
WE BUY USED

➤ CISCO ➤ Bay Networks ➤ 3COM ➤ Ascend ➤ Livingstan ➤ IBM
➤ ADC Kendrax ➤ Adtran ➤ USRobotics ➤ Shiva ➤ HP
➤ Newbridge ➤ Cabletran ➤ Sun
➤ Matarala ➤ Madge ➤ Intel

www.digitalwarehouse.com
DIGITAL WAREHOUSE
Your Information Superhighway Discount Source®

VISA **800-439-8558** MasterCard

210-20 23rd Ave. Suite #2, Bayside, NY 11360 Phone: 718-428-3139 Fax: 718-281-1186

Circle Reader Service No. 259

REFURBISHED PRODUCTS

NETWORKING

ROUTERS • SWITCHES • HUBS

CISCO, CABLETRON, SYNOPTICS

BAYNETWORKS, CHIPCOM, XYPLEX, WELLFLEET, IBM, KALPANA, NETWORTH, XYLOGICS, 3COM, DIGITAL, PROTEON, MADGE, HP

International Resellers of Routers, Switches & Hubs
BIZI
Business Information Zygoun International Inc.®

NY
Tel: (315) 458-9606
Fax: (315) 458-9493
MA
Tel: (508) 667-4926
Fax: (508) 663-0607
http://www.bizint.com

On parle français · Hablamos español · Wir sprechen deutsch

Circle Reader Service No. 219

LAN/WAN • BUY/SELL
FULLY WARRANTEED
NEW/REFURBISHED
RENTAL
LEASE

MODEMS
DSU/CSU's
MULTIPLEXERS
T-1 EQUIPMENT
HUB, BRIDGES, ROUTERS, ETC.

Fibermux AT&T Synoptics

CISCO SPECIALISTS

Cabletron Bay Networks

We carry all manufacturers, call John, ext. 101.

http://www.adcs-inc.com
PHONE
800-783-8979
FAX (916)
781-6962

ADCS INC.

Circle Reader Service No. 240

NetWorld+Interop NetWorld+Interop NetWorld+Interop

Don't miss the October 6th issue of *Network World* with bonus distribution at NetWorld+Interop in Atlanta!

Issue Close: September 24
Call Enku Gubaie
1-800-622-1108 ext. 465

FACTORY DIRECT SAVINGS

Fiberdyne Labs, Inc.

Made in U.S.A.

State of the Art Ethernet
AUI TO 10 BASE FL
Fiber Optic
Transceiver

Model
FTX-A11

FTX-A11 Pricing

Qty	Unit Price
1-5	$131.00
6-20	$124.00
21+ Call (800) 894-9694	

FIBERDYNE LABS, INC.
818 Park Lane Dr., Herkimer, NY 13350
(315) 866-0310 · Fax (315) 866-0341
www.fiberdyne.com

Circle Reader Service No. 291

1-800-AKA-3COM

LAN\WAN 3Com® NEW/USED WE BUY AND SELL

HUGE INVENTORY
WE TEST ALL PARTS BEFORE WE SHIP

"TECK" SUPPORT
AUTHORIZED PRODUCT & SERVICE CENTER

WORLD'S LARGEST SUPPLIER

QUALITY OUR 14TH YEAR SINCE 1983

ONE YEAR WARRANTY ON ALL USED EQUIPMENT

NEW / USED 3 COM PARTS

SPECIALS **NEW**

3C509B-TPO	$59.ea	3C6022A	$600.
3C509B-COMBO	$79.ea	S.M.C.12-PORT	$275.
3C900-TPO	$79.	6-PORT 100BT HUB	$495.
FMS 12-PORT HUB	$295.	3C905TX	$84.
FMS 24-PORT HUB	$495.	3C250BTX/I	$950.
FMS2 24-PORT	$740.	3C562D-combo	$295.
LANPLEX 2500	$2795.	3C16900A	$2095.
NetBuilder2 4-SLOT	$1300.	3C16901A	$1875.

ERGONOMIC ENTERPRISES INC.
47 WERMAN CT. | PLAINVIEW, NY | 11803
PH: 516-293-5200 FAX: 516-293-5325
visit us at http://www.800-AKA-3COM.com

logos are registered trademarks of the companies they represent.

We Accept: VISA • MASTER CARD • AMEX • C.O.D. • NET TERMS

CISCO SYSTEMS · CABLETRON SYSTEMS · intel · IBM · Kalpana · proteon · CHIPCOM · SynOptics · SMC · Bay Networks

Circle Reader Service No. 271

Category 5

Premium Patch Cords

Our Patch Cords exceed the EIA/TIA 568a specification.

- Contacts: 50m gold platin
- Wire: 24 Awg. stranded, Category 5
- Stranded wire is very flexible
- Molded strain reliefs available
- Available in Black, Ivory, White, Red, Gree, Blue, Yellow, Gray, Hot Pink, Orange & Purple

3 ft	1.45
6 ft	1.90
10 ft	2.50
15 ft	3.25
25 ft	4.75

In Lots of 5
11 Colors Available

Bulk Wire

CAT 5 pvc	AS LOW AS	$65.00
CAT 5 plenum	AS LOW AS	$190.00
19" Data Rack		$126.00

CAT 5 Patch Panels

12 PORT Mini	$55
24 PORT	$85
48 PORT	$170
96 PORT	$330

All Patch Panels are UL & EIA/TIA Verified

Outlets

CAT 5 Inserts	3.20 ea
Faceplate	1.00 ea

Fiber Optic Cords

5T-ST Duplex 62.5/125	$23.00

ELECTRO PRODUCTS • Call 1-800-423-0646
Or fax your request to (206) 859-9101

Circle Reader Service No. 246

For More Information About Marketplace
1-800-622-1108

REFURBISHED

Bay Networks SynOptics WELLFLEET communications

Largest Inventory of Refurbished Bay Networks in America!

- Bay Networks Trained
- Bay Networks Authorized
- Hundreds of pieces in stock
- New and Used Equipment
- Proven Track Record
- One Year Warranties
- Design and Install Services
- Technical Support

CABLETRON SYSTEMS The Complete Networking Solution™ · 3Com · IBM · MADGE · NOVELL

On-Sight Router Installation

WE REPAIR ALL BAY NETWORKS!

National LAN Exchange 800-243-5267
1403 W. 820 N. Provo, UT 84601 FAX 801-377-0078 http://www.nle.com
C.O.D.'s • VISA • Mastercard • Discover • Terms

Circle Reader Service No. 231

NETWORK WORLD, INC.

THE MEADOWS
161 WORCESTER ROAD, FRAMINGHAM, MA 01701-9172
(508) 875-6400/FAX: (508) 879-3167

Colin Ungaro, President/CEO
Evilee Thibeault, Senior Vice President/Publisher
Mary Kaye Newton, Assistant to the President
Eleni Brisbois, Sales Associate

ADMINISTRATION

Mary Fanning, Vice President Finance and Operations
Frank Coelho, Office Services Manager
Paul Mercer, Billing Manager
Mary Rinaldo, Telecommunications Administrator
Tom Garvey, Mailroom Supervisor
Tim DeMeo, Mailroom Assistant

HUMAN RESOURCES

Mary Cornetta Brown, Vice President, Human Resources
Danielle Volpe, Human Resources Representative

MARKETING

Virginia Lehr, Director of Marketing
Kristin Wattu, Marketing Communications Manager
Barbara Sullivan, Market Research Analyst
Heidi Creighton, Public Relations Manager
Donna Kirkey, Marketing Design Manager
Nancy Vickers, Graphic Designer

GLOBAL PRODUCT SUPPORT CENTER

Joanne Wittren, Senior Global Marketing Services Manager

ADVERTISING OPERATIONS

Karen Wallace, Director of Advertising Operations
Ann Jordan, Senior Advertising Account Coordinator
Marlo Matoska, Advertising Account Coordinator
Sean Landry, Direct Response/Recruitment Ad Coordinator

PRODUCTION

Ann Finn, Production Director
Greg Morgan, Production Supervisor
Cathy Sampson, Print Buying Supervisor

RESEARCH

Ann MacKay, Research Director

CIRCULATION

Sharon Smith, Senior Director of Circulation
Richard Priante, Director of Circulation
Bobbie Cruse, Assistant Circulation Director
Mary McIntire, Circulation Assistant

IDG LIST RENTAL SERVICES

Elizabeth Tyle, Sales Representative
P.O. Box 9151, Framingham, MA 01701-9151
(800) 343-6474/(508) 370-0825, FAX: (508) 370-0020

PROFESSIONAL DEVELOPMENT GROUP

William Reinstein, Senior Vice President/Business Development
Debra Becker, Marketing Manager
Christie Sears, Finance/Operations Manager
William Bernardi, Senior Product Specialist
Peter Halliday, Product Manager/NetDraw
Andrea D'Amato, Sales Manager/ Strategic Partnerships
Sharon Schawbel, Product Specialist
Betty Amaro, Operations Specialist
Sarah Woodman, Marketing Specialist

ONLINE SERVICES

Ann Roskey, Director, Online Services
Jean-Olivier Holingue, Web Technology Manager
Clare O'Brien, Online Sales Manager
Pam Kerensky, Web Operations Specialist
FAX: (508) 820-1283

INFORMATION SYSTEMS/DIGITAL IMAGING SERVICES

Michael Draper, Vice President Information Systems
Jack McDonough, Director of Systems and Technologies
Rocco Bortone, Network Administrator
Anne Nickinello, Digital Imaging Manager
Deborah Vozikis, Imaging Specialist
FAX: (508) 875-3090

DISTRIBUTION

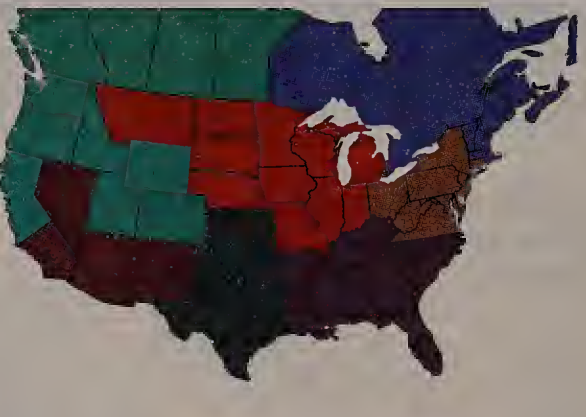
Bob Wescott, Distribution Manager
(508) 879-0700

IDG

Patrick J. McGovern, Chairman of the Board **Kelly Conlin**, President **Jim Casella**, Chief Operating Officer **William P. Murphy**, Vice President Finance

Network World is a publication of IDG, the world's largest publisher of computer-related information and the leading global provider of information services on information technology. IDG publishes over 275 computer publications in 75 countries. Ninety million people read one or more IDG publications each month. *Network World* contributes to the IDG News Service, offering the latest on domestic and international computer news.

SALES OFFICES



Carol Lasker, Advertising Director
Internet: clasker@nww.com
Debbie Lovell, Sales Associate
(508) 875-6400/FAX: (508) 879-5760

NORTHEAST

Tom Davis, Eastern Regional Manager
Aimee Damiani, Sales Assistant
Donna Pomponi, Senior District Manager
Kevin Gasper, District Manager
Elisa Scheuermann, District Manager
Michael Eadie, Account Executive
Internet: tdavis, dpomponi, kgasper, elisas, meadie@nww.com
Jolene Springfield, Sales Assistant
(508) 875-6400/FAX: (508) 879-5760

MID-ATLANTIC

Jacqui DiBianca, Senior District Manager
Rick Groves, District Manager, Sales Manager IntraNet Magazine
Internet: jdibian, rgroves@nww.com
Barbara Stewart, Sales Assistant
(610) 971-1530/FAX: (610) 975-0837

MIDWEST

Bob Mitchell, District Manager
Internet: bmitchel@nww.com
Anna Caran, Sales Assistant
(847) 297-8855/FAX: (847) 827-9159

CENTRAL

Dan Gentile, Midwest Regional Manager
Internet: dgentile@nww.com
Anna Caran, Sales Assistant
(512) 246-7044/FAX: (512) 246-7703

NORTHWEST

Sandra Kupiec, Western Regional Manager
Paula Connor, Senior District Manager
Susan Rastellini, District Manager
Kevin Octavio, District Manager
Carol Stiglic, District Manager
Internet: skupiec, pconnor, slr, koctavio, cstiglic@nww.com
Mandy Tiedje, Sales Assistant
Brenda Mays, Sales Assistant
(408) 567-4150/FAX: (408) 567-4166

SOUTHWEST

Amy C. Bartulis, Senior District Manager
Internet: abartuli@nww.com
Becky Bogart, Sales Assistant
(714) 250-3006/FAX: (714) 833-2857

SOUTHEAST

Don Seay, Senior District Manager
Internet: dseay@nww.com
Terry Sanders-Prentice, Sales Assistant
(770) 394-0758/FAX: (770) 394-6354

DIRECT RESPONSE ADVERTISING
Response Card Decks/Marketplace

Joan Bayon Pinsky, Director Direct Response Advertising
Richard Black, Account Manager
Heather Fairbanks, Account Manager
Enku Gubaie, Account Executive
Internet: jpinsky, rblack, hfair, egubaie@nww.com
Sharon Chin, Sales/Marketing Operations Coordinator
Chris Gibney, Sales Assistant
(508) 875-6400/FAX: (508) 628-3976

RECRUITMENT ADVERTISING

Dodi Rabinovitz, Senior Recruitment Director
Internet: ccapp@nww.com
Carla Cappucci, Sales Associate Central U.S. Territory
(508) 875-6400/FAX: (508) 820-0607

EDITORIAL INDEX

A
Aironet....47
Apple....84
Ascend....1,12,23
Assured Access....1
AST....17
AT&T....33
B
BackWeb....40
Bain....6
Bay....1,23,30,78
BBN Planet....33
Be Here....34
Beamscope....35
Bell Atlantic....6,33
Bell Canada....33
C
Cabletron....23
ChatCom....59
Check Point....6
Chips & Technologies....17
Cisco....9,23,30,78
Citrix....8
CNT....78
CommVision....59
Compaq....40
Concert....33
Cruise Technologies....8
Cubix....59
Cyrix....17
D
Dascom....35
Data General....17
DataBeam....16
Digital....6,16,44
Digital Ocean....47
E
Ennovate....9
Entrust....6
H
HP....16
I
IBM....1,6,8,16,23,27,35,37,78
Intel....16,17
Ipsilon....9
Ironside Technologies....35
J
JetForm....35
K
Kinetoscope....80
Kiva....6
L
Lotus....1,6,35,37,49,80
Lucent....6,33,47
M
MCI....33
Microsoft....1,6,15,16,17,18,30,35,
....36,37,40,49,80,84
Mustang Software....36
N
National Semiconductor....17
Netscape....1,6,16,30,35,36,
....37,40,49,80
NetScout....23
Novell....6,12,30,35,49
NuView....17
NYNEX....6
O
Octel....33
OnLive Technologies....16
Oracle....6,40
P
PointCast....40
Progressive....40
Q
Qualcomm....6
R
Raptor....40
Real-Time Knowledge Systems....80
Rockwell....23
S
Samsung....17
Sassafras....23
Security Dynamics....12
Sprint....33
Sun....1,6,8,15,16,35,80
Symantec....15
T
Tandem....6
Technologic....35
Toshiba....9
Transarc....6
U
U.S. Robotics....23
UUNET....40
V
VDOnet....40
VeriSign....40
Virtual Motion....17
Visigenic....12
VXtreme....40
X
Xedia....9
Z
Zoomit....30

ADVERTISER INDEX

Advertiser	Reader Service#	Page#
3Com		10-11
Alcatel Data Networks	8	45
Allegro Group	303	65
AMP	9	85
APC/Dell	30	38-39
Apex PC Solutions	251	67
Async Technologies Inc.	242	74
Bay Networks	10	62
Belden Wire and Cable	11	56
Castle Rock Computing	252	65
Compaq Computer Corp		2-3,54-55
Computer Associates	22	4
Compuware Corp	12	22
Cybex Computer Products	227	68
Digex	23	46
Eastern Research Inc.	225	65
ForeFront Direct Inc.	237	66
General Signal Networks	265	69
Global Technology Associates	292	68
Hewlett Packard		7
HT Communications	229	74
IBM		17,31,41,42
Imation		77
JVC Inc.	24	18
Lucent Technologies		13,14
Markham Computer Corp	228	73
Microsoft		20-21,28-29
Microtronix Datacom	263	66
Mier Communications	288	70
Network Instruments	290	72
Newbridge Networks	31	CV1
NORTEL	13	32
Paradyne Corp.	14	58
Precision Guesswork	254	68
Procom Technology	25	26
Racal Datacom	15	19
RAD Data Communications	26	27
RADCOM	295	72
Raritan Computer	314	66
Rose Electronics	289	70
Shiva	17	24-25
Siemens Business Corp	27	36-37
Softbank		83
Solunet Inc.	298	72
*Southwestern Bell	16	53
Sprint		86
Standard Microsystems	28	57
Swiss Telecom	18	61
Technologic Inc.	223	72
Telecommuting & Home Office Expo		44
The Know Zone	247	74
TODD Enterprises Inc.	266	70
Transcender	222	74
Transend Corp	20	34
Tron International	233	70
Trusted Information Systems	19	79
West Hills LAN Systems	297	71
WilTel	21	8-9
XCd Inc.	29	15

Intranet Magazine

Advertiser	Reader Service#	Page#
American Power Conversion	5	11
Axis Communications	7	28
Capella Worldwide Networking	165	25
Check Point Software	3	2
Compaq Computer Corp		14-15
Cookware Inc.	169	25
Faximum Software	187	25
Milkyway	6	27
NetPartners Inc.	4	7
Qualcomm	1	4
Server Technology	185	25
The Internet Access	190	25
USWeb Corp		22
UUNET	2	9

Network World Fusion - www.nwfusion.com

3Com (3)
American Internet
AMP
Anixter
Ariel Corporation
Bay Networks
Cisco PIX Firewall
Compaq
Compuware
Gartner Group (3)
IBM (6)
Intel
Make Systems
Microsoft Windows NT Server
NetSpeed
Novell Solutions
Nuera
Pilot Network Services
Pulver.com
Shiva (2)
US Robotics
US West
Utopia Tech. Partners (UTP)
WRQ
WYSE Technologies

These indexes are provided as a reader service. Although every effort has been made to make them as complete as possible, the publication does not assume liability for errors or omissions.

*Indicates Regional/Demographic

DIRECTORY OF SERVICES

NetworkWorld TECHNICAL SEMINARS

Network World Technical Seminars are one and two-day, intensive seminars in cities nationwide covering the latest networking technologies. All of our seminars are also available for customized on-site training. For complete and immediate information on our current seminar offerings, dial our instant fax-back service at 800-756-9430 from your touch tone phone or call a seminar representative at 800-643-4668.

NetDraw Clip Art for Building Networks™

Create diagrams, proposals and network upgrade "what-if" scenarios fast and easily with *Network World's* NetDraw and NetDraw Plus software. At your fingertips, you will find over 1,700 full color network images, many the exact replicas of manufacturer-specific equipment. New in NetDraw Plus v3.0 are library search by keyword to speed access to the right image, the ability to attach text to lines, full image rotation, custom zoom level for exact frame of reference and way more! Call 800-643-4668 to order your copy today for only $149! Or get immediate fax-back information by dialing 800-756-9430 and request document code #10.

Network World REprints

Publicize your press coverage in *Network World* by ordering reprints of your editorial mentions. Reprints make great marketing materials and are available in quantities of 500 and up.

To order, contact Reprint Services at 612-582-3800 or 315 5th Ave. N.W., St. Paul, MN 55112.

*Our instant fax-back service delivers information on many of these products. Dial 800-756-9430 from your touch tone phone and use the appropriate document code to have information faxed right back to your fax machine!**

LEAVE IT ALONE.

The fully-automated Imation Tape Library Systems.

Hook them up and walk away. That's the beauty of our Imation™ Tape Library Systems. They automatically change tapes, which is great if you're finding yourself with a beast of a back-up job. Designed to grow with your needs from 60 GB to 1.28 TB, ITL systems integrate the latest tape and robotics hardware with advanced software from Cheyenne. That makes back-up seamless and trouble-free. What's more, they're fast, reliable and affordable. And they come with our incomparable Imation service, which gives you a single, no-excuses point of contact for installation and maintenance. Contact your local VAR or call us direct at 1-800-888-2700. Or visit us at www.imation.com/itl. And find out about the back-up systems that love to work alone.

CHEYENNE
A Division of Computer Associates

IMATION
Borne of 3M Innovation

Imation and the Imation logo are trademarks of Imation Corp.
Cheyenne is a registered trademark of Computer Associates
© Imation 1997.

SNA

Continued from page 1

multiprotocol switch and low-end 2210 router with the new software.

IBM already offers a mainframe-based tn3270 package, but the new software should be less expensive to run, executives said. Customers also have the option of running a tn3270 server from IBM's server software suites, but the new packages are targeted at much larger networks.

SHARE
Technology • Connections • Results

The new software also will help IBM compete more effectively with companies such as Cisco Systems, Inc., which already has a tn3270E server in its channel-attached router. Other vendors, such as Bay Networks, Inc., are looking to grab a piece of the multibillion dollar data center connectivity pie as well. Bay last week unveiled its own channel-attached router with a tn3270 gateway (see story, this page).

Customers, such as Boeing Co. of Seattle, are happy that tn3270 connectivity choices are growing.

"We like tn3270 be-cause tn3270 clients are available from a wide variety of emulation vendors. Java applets now contain tn3270 for Web browsers and [we can use] tn3270 clients to communicate with most of our [trading partners] over the Internet," said Craig Stolze, a network systems analyst with the aircraft maker. Boeing uses software from Apertus Technologies, Inc. to control more than 20,000 tn3270 sessions flowing through its backbone.

"We depend heavily on easy access to our SNA applications, particularly [an IBM IMS transaction processing database] over TCP/IP, so tn3270 is critical to that," Stolze said. "The ability to off-load [processing from] servers, provide high availability and load balance are also key factors." Indeed, those are some of the driving forces behind the IBM announcement.

Users can more easily and inexpensively scale tn3270 environments just by adding another 2216, said Gilles Garcia, a member of IBM's WAN and server access team in La Gaude, France. A stripped-down 2216 can cost about $12,000.

Garcia noted that as part of this announcement, IBM will more than triple the number of sessions and users the 3746 and 2216 can handle to 30,000 and 5,000 from 6,400 and 1,500, respectively. This way, customers can support more links and sessions for the same cost.

By adding tn3270E server support to the low-end 2210 router, a device that can cost as little as $1,500, the cost of adding tn3270 servers goes down even more, Garcia said. Plus, users can locate a tn3270 server closer to remote users if necessary.

IBM will help customers build more efficient SNA-to-TCP/IP backbones with the release of Dispatcher load-balancing software for the 37xx, 2216 and 2210. This software discovers TCP/IP net device addresses and, based on customer-defined parameters, directs incoming traffic to the least busy net device. Net Dispatcher is the software IBM used to manage the huge amount of traffic generated by its Summer Olympics Web site last year. In its first iteration, Net Dispatcher ran on IBM's SP2 and RISC System/6000-based servers.

If a server or communications device crashes, Net Dispatcher will redirect traffic to another server or device. New devices easily can be brought online and old devices can be taken offline for maintenance without disrupting usage, IBM said. IBM did not disclose pricing. ■

Get more Information online at www.nwfusion.com.
DocFinder: 3419

IBM, Cisco move backbone battle to the test labs

IBM claims its channel-attached product performs better than Cisco's.

By Michael Cooney
Atlanta

IBM and Cisco Systems, Inc. are moving their battle for the corporate backbone off the street and into the test lab.

At last week's Share user group meeting, IBM passed out performance test results comparing its 2216 mainframe channel-attached Multiaccess Connector and Cisco's channel-attached router, the 7500-based Channel Interface Processor (CIP). Both boxes connect LAN, SNA and TCP/IP traffic to the mainframe via a mainframe channel connection.

The test, audited by The Tolly Group, an independent testing facility in Manasquan, N.J., showed that IBM's 2216 significantly outperformed the CIP in SNA and TCP/IP mainframe channel throughput (see graphic).

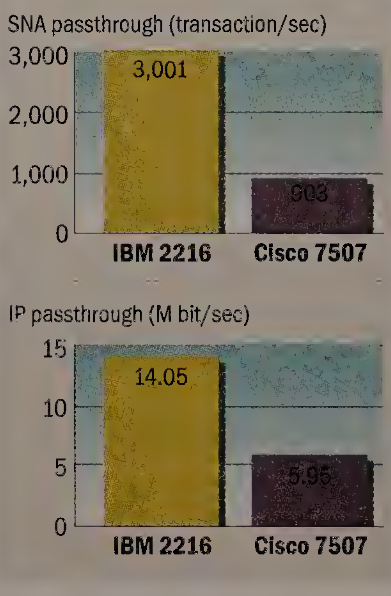
Cisco executives dismissed the test, calling it more of a test of adapter throughput than platform performance.

"We challenge IBM to do this kind of testing totally out in the open in a public forum," said Jeff Graham, CIP product manager for Cisco. "We were not consulted on this test, and it's not a very open way for users to get any meaningful results."

For customers, the likely result of this latest round of sparring will be increased confusion as they try to determine the best way to migrate legacy equipment to new multiprotocol backbones. The test bed at IBM's Washington Systems Center, in Gaithersburg, Md., included a 2216 Model 400 supporting dual Enterprise Systems Connection (ESCON)-based mainframe channels and a token-ring LAN. The Cisco configuration used a Model 7507 router outfitted with a CIP-2 processor supporting dual ESCON attachments and a token-ring LAN, according to IBM.

IBM BEATS OUT CISCO

Benchmark results from Manasquan, N.J.-based consultancy, The Tolly Group:



Jim Goethals, an enterprise solutions manager with IBM, said the test bed supported about 48 servers and a number of traffic generators to build real-life traffic simulations, such as 1K-to-16K TCP/IP file transfers and standard SNA batch transfers.

Tests were first conducted by IBM, then by The Tolly Group.

The tests fly in the face of recent Cisco tests. Those compared a CIP with IBM's 3745/3746 front-end processors (FEP) — the box Cisco competes with most often.

Those tests, which were not independently audited, showed that the CIP-2 can send traffic to and from the mainframe at 5,500 frame/sec, compared to 3,600 frame/sec for the 3745-31A and 1,200 frame/sec for the 3746-900. Using a 170-byte transaction, the CIP-2 handled 6,100 frame/sec, while the 3745-31A handled 3,600 frame/sec and the 3746-900 handled 1,200 frame/sec.

The tests also showed the CIP-2 could support nearly four times the amount of SNA sessions as the FEPs. IBM dismissed that test as being "too LAN-centric and not indicative of typical SNA configurations." ■

Bay switch takes on SNA-TCP/IP integration role

By Jim Duffy
Billerica, Mass.

Bay Networks, Inc. last week announced a channel-attached gateway that provides SNA-to-IP capabilities and Web browser access to IBM mainframes.

The 5745 Enterprise Server Module (ESM), which fits into Bay's System 5000 switching hub, was expected (*NW*, June 9, page 1). The module is the result of an OEM relationship between Bay and Computer Network Technology Corp. of Minneapolis.

The 5745 ESM provides SNA-to-TCP/IP gateway capabilities by linking end users to IBM mainframes via channel or LAN attachment.

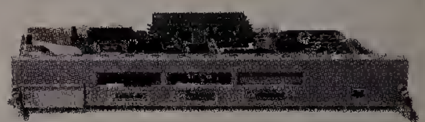
The product functions like a tn3270E gateway, enabling TCP/IP users to access a mainframe that does not support TCP/IP. The 5745 ESM also supports passthrough of SNA and IP traffic, so the module functions like a traditional channel-attached LAN gateway.

In addition, the gateway module features the Bay Web Integrator, server software that facilitates access to mainframe applications by users of Java-enabled browsers.

Gibson Greetings in Cincinnati is looking to purchase another SNA-to-TCP/IP gateway for redundancy and finds the 5745 ESM a more cost-effective alternative to the OpenConnect Systems, Inc. gateways it is already using.

"[The OpenConnect products have] been working very well for us," said Michael Jordan, manager of technical services for Gibson. "But it was a better financial decision to go with the 5745" for redundancy, he said.

The 5745 ESM, which will ship in November, starts at $11,995.



Bay's 5745 ESM *gateway can be LAN- or channel-attached to an IBM mainframe.*

About the only SNA-to-TCP/IP applications that the 5745 ESM is not designed to handle are replacing an IBM front-end processor (FEP) and TCP/IP off-load.

Bay is not addressing FEP replacement because the company is focused on migrating customers to IP, not maintaining SNA, said Don McGinley, Bay's senior product manager for SNA. Bay is passing on TCP/IP off-load because IBM has made mainframe processing of TCP/IP more efficient, he said.

The 5745 ESM requires two slots in a 14-slot System 5000 chassis. Each module contains a 10Base-T Ethernet interface and supports the attachment of up to two network adapters. Three LAN adapters are available: 16/4 Token Ring, 10/100 Ethernet and FDDI. Parallel and Enterprise Systems Connection channel adapters are available, and a maximum of one channel card is supported per ESM.

Each ESM supports up to 4,000 SNA sessions, Bay said. The module will compete with Cisco Systems, Inc.'s Channel Interface Processor, which slides into Cisco's 7000 series routers, and Cabletron Systems, Inc.'s Channel Interface Modules for its MMAC-Plus switching hubs.

✆ Bay: (508) 670-8888

GVPN True global network security is here. Our Global Virtual Private Network (GVPN) portfolio including Net Extender and PC Extender, together with Gauntlet Firewalls and strong encryption, enables worldwide VPN business applications.

e-Commerce With RecoverKey™ technology, TIS is at the forefront of strong exportable encryption for securing global electronic commerce.

Video Conferencing Our generic streaming multimedia proxy allows secure real-time data access – for audio/ video communications and multimedia services over the Internet.

Security Consulting A long list of Fortune 100 companies have chosen TIS Commercial Consulting to assure their worldwide security -- with every service from vulnerability analysis to system deployment.

Remote Management Gauntlet's new firewall management station provides secure global remote management for all standard facilities and options. Its enhanced Java-based GUI makes it user-friendly, extendible, easy to administer and configure.

Now--where in the world is your security?

GAUNTLET

Only one information security company in the world enables you to take advantage of business opportunities globally: Trusted Information Systems. With our portfolio of Gauntlet® products, you can fully utilize the Internet for business applications worldwide, deploy your own GVPN at significant cost savings, and be completely confident about your security -- because our firewalls use application-specific proxies, the most secure technology in the business. It's what you'd expect from a company that's delivered trusted network security solutions for 15 years.

Whether you're UNIX or NT-based, wherever you do business, if you want security and the efficiency of doing business over the Internet with complete security, here's your solution. **Call 1-888-TIS-FIRST.**
www.tis.com e-mail: gauntlet-solutions@tis.com

tis
TRUSTED INFORMATION SYSTEMS, INC.
Building a World of Trust™

Gauntlet, Gauntlet logo, and RecoverKey are registered trademarks of Trusted Information Systems, Inc.

Circle Reader Service **#19**

JDL

Continued from page 1

emphasis on a truly portable, reliable standard implementation of the Java platform," Ross said. "Developers should be able to do simple things like create and deploy menus and toolbars for an application in a way that's consistent with the 'write-once, run-anywhere' mantra."

Ross said the JDL hopes to persuade Sun and Microsoft to focus on problems currently facing developers, rather than long-term marketing strategies.

"Some emphasis needs to be placed on the fundamentals," Ross said. "I would like my Java tools to be at least as good as the C++ tools I had five years ago. It bothers me that they're not."

A Sun spokesman said the company welcomed the new organization's input.

"Java is an industrywide effort that has been shaped largely by the demands of developers," said George Paolini, director of corporate marketing at Sun's JavaSoft division. "We're thrilled to see these developers banding together to stand up for the concept of 'write-once, run-anywhere' and for truly cross-platform Java computing.

Ross put up a Web site for the JDL (www.javalobby.org) early last week, promoting it only by posting notices in a handful of Java-oriented newsgroups and mailing lists.

Response was swift. Last Thursday alone, more than 100 developers joined the JDL, whose members come from the United States, Canada, Europe and South America. Membership is open to anyone, and joining involves e-mailing a form.

So far, most JDL members appear to be independent software developers in small shops. But Ross said he expects "corporate developers to end up representing the core of our constituency."

"Enterprise developers are deeply interested in Java because it gives them the ability to write code that is going to last," he said. "If Java is truly portable and scalable, then the huge reinvestment they constantly face as they migrate from platform to platform will not continue to hemorrhage their overall budgets."

The JDL agenda

Goals of the Java Developer's Lobby:

- Provide a unified voice for Java software developers
- Attract large-enterprise developers as members
- Push for high-quality Java development tools
- Work directly with tool and operating system vendors to improve Java tools
- Provide online news and information resources about relevant issues

One member who joined last Wednesday is Geoff Sherman, a Java developer at the University of Illinois in Urbana.

"There's a movement in the university system toward Java, but it's difficult to teach because it changes so much, and there are so many different versions," Sherman said. "For somebody who's just getting into it and wants to do some programming, it can be confusing," he said.

Ted Young, CEO of Advanced Web Technologies, Inc., a New York-based Java training and outsourcing company, blamed Microsoft for confusing the market about what Java is and can do.

"Microsoft is trying to promote as much fear, uncertainty and doubt as possible because it doesn't serve their interests for Java to be truly cross-platform," he said. But Young said there are larger factors "slowing the development of good Java tools," including problems caused by Sun ally Netscape Communications Corp. "The browsers are the biggest issue," he said. "In terms of delivering Java applets to end users, the browsers are an insufficient platform. And Netscape is just as much, if not more, to blame as Microsoft. Netscape's Communicator doesn't even fully support Java 1.1."

Young, while not a member of the JDL, said he hopes the new group has an impact. "The developers are getting stepped on by these battles waging back and forth," he said.

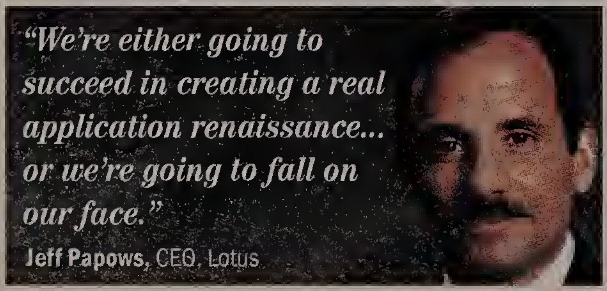
Ross, for his part, said his goal is not to identify villains or take sides. "We have no group affiliation with or allegiance to any of the companies developing products related to Java, and we're not trying to be antagonistic to anyone," he said. "We just want better Java tools." ■

Get more information online at www.nwfusion.com.
DocFinder: 3420

Papows, Gates powwow over Java

By Paul McNamara
Boston

Warning that the fate of Java depends on the willingness of vendors to avoid turf battles, Lotus Development Corp.'s top executive last week said he was flying cross-country to meet with Microsoft Corp. CEO Bill Gates to talk about objects.



"We're either going to succeed in creating a real application renaissance... or we're going to fall on our face."
Jeff Papows, CEO, Lotus

Pitting Microsoft's proprietary Distributed Component Object Model (DCOM) against the Object Management Group's Common Object Request Broker Architecture (CORBA) is counterproductive, said Lotus CEO Jeff Papows. Only the "naive" would envision either going away, said Papows, who was to meet with Gates last Friday.

Object request brokers allow distributed objects, whether written in Java or another language, to interact with one another across a network.

"Rather than argue about DCOM and CORBA, we have to define the semantics of the workings of those object models in pure Java, so we can write once and run anywhere across object models," Papows said in his keynote at DCI's Internet Expo in Boston. "It's a completely possible, completely manageable task if the vendor behavior does not become equally polarized and screw it up."

Papows earlier had told the audience that the prospects of realizing the write-once, run-anywhere promise of Java are at an important crossroads.

While others have accused Microsoft of working to stunt Java's maturation as a ubiquitous programming language, Papows struck a more conciliatory tone in his speech.

"Microsoft is not being counterproductive here," he said. "They simply want to avoid a least common denominator approach to the way we optimize our use of a desktop-centric environment that is obviously extremely Windows-centric and is going to be [down the road]."

Some attendees were heartened by Papows' call for cooperation.

"I realize it may cause problems for [vendors] in terms of differentiating their products," said Douglas Hunt, an Internet/intranet developer with Hartford Financial Group in Hartford, Conn. "But they've got to cooperate, [and] if they don't we're going to make them."

After his speech, Papows told reporters that his Redmond meeting was at the behest of Gates and would cover other Lotus/Microsoft initiatives in addition to object brokers. The two companies recently announced that Lotus Notes 4.6, due to ship this week, will be tightly integrated with Microsoft's Internet Explorer 4.0 once the browser is released.

Netscape Communications Corp.'s Navigator was the odd browser out, as Lotus decided the browser's packaging with Netscape's Communicator groupware/messaging suite made Navigator unsuitable for bundling with Notes. Papows said he is still open to an unbundled Navigator returning to Notes.

He also said Microsoft's recent $150 million investment in Apple Computer, Inc., is "an indication of how serious Microsoft is about owning the browser space."

Lynda Radosevich and Rebecca Sykes of IDG News Service's Boston bureau contributed to this story.

Kinetoscope zooms in with Java 'intelligent agent' tool kit

By Ellen Messmer
New York

Java is expected to show signs of higher intelligence when start-up Kinetoscope, Inc. unveils a tool kit for building Java software robots and messengers at the Java Internet Business Expo here next week.

The Versatile Intelligent Agent kit contains prebuilt Java and HTML agents that are run and managed in the VIA Agent Manager on a Java-enabled Web server. The agents can execute assigned search-and-retrieval tasks across the Internet and private intranets, enter databases, and dispatch e-mail, paging alerts, faxes and more.

A number of companies are so impressed with VIA technology that they intend to retool their existing products around it, or let the intelligent agents roam the corporate intranet.

Campbell, Calif.-based Real-Time Knowledge Systems, Inc., markets Crush strategic planning software that enables executives to calculate market share and trends. The company is now developing a next-generation version of Crush built around VIA. The new Crush for Workgroups application will work like a dynamic spreadsheet fed by VIA agents. Randy Hain, president and chief technology officer of Real-Time, said VIA agents differ from typical Web crawlers in that they do not just haul back data, but instead can be programmed to filter it, display it or update a database.

INTERNET
EXPO
JAVA
BUSINESS

Schlumberger Corp. has a pilot project underway in which Kinetoscope is developing a server-based distributed knowledgebase that would let authorized employees use e-mail to submit and extract information. Queries would be sent to a mail-to-Web gateway in which search agents inside the servers could locate the relevant information.

VIA complies with the Java Development Kit 1.1, the latest Java specification from Sun, said Gerry Deseve, Kinetoscope's director of marketing and strategy. "Until now, there hasn't been a unified package like VIA, which has features like intelligent rollover to figure out where people are." ■

FALL/WINTER TOUR

Nov. 5	Boston
Nov. 6	New York
Nov. 12	Minneapolis
Nov. 13	Chicago
Dec. 9	Washington, D.C.
Dec. 10	Philadelphia
Feb. 10	Irvine
Feb. 11	San Francisco
Feb. 18	Atlanta
Feb. 19	Dallas

Directed and presented by Mark Miller

NetworkWorld
TECHNICAL SEMINARS

IMPLEMENTING IPv6

Migrating Your Internetwork to the Next Generation Internet Protocol

PLANNING FOR THE NEXT GENERATION INTERNET PROTOCOL

The next generation of Internet Protocol – IPv6 will significantly impact your TCP/IP network. The Internet explosion now requires new functions that go beyond the capabilities of the current Internet Protocol, or IP. These include enhanced security, support for real-time traffic flows and expanded addressing capabilities. The addressing issue has been one of the most significant concerns as it has been predicted that the Internet community will run out of available addresses in the future, thus limiting the growth of this critical communication resource.

However, if IP is revised, other protocols must be changed as well. The significance of this protocol revision extends to LANs, MAN and WAN transmission systems, as well as the upper layer protocols and operating systems.

Whether you are a network manager, designer or application developer, this seminar will provide you with information on how to effectively plan and implement a successful, orderly transition from IPv4 to IPv6.

Network World Exclusive:

IN-CLASS IPv6 INTEROPERABILITY LAB

A key part of *Implementing IPv6: Migrating Your Internetwork to the Next Generation Internet Protocol* is an interoperability demonstration network that will be built including routers, hosts and workstation software using various sponsors' IPv6 products. Sponsor representatives will be available to answer your questions regarding their plans for IPv6 product implementation.

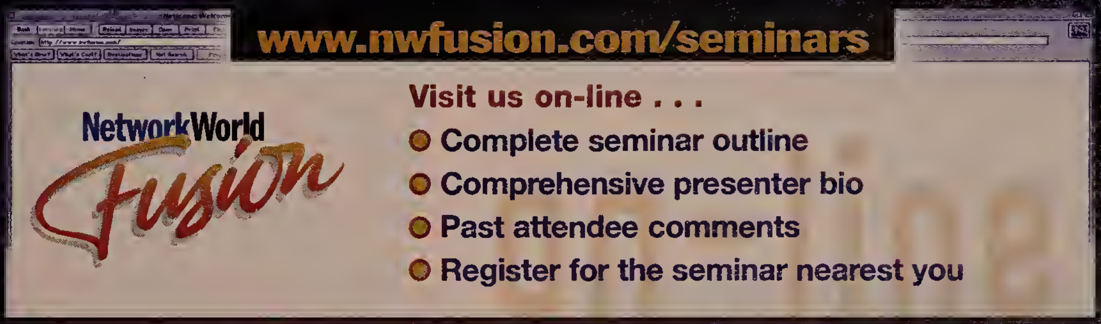
10 COURSE BENEFITS YOU DON'T WANT TO MISS!

1. Understand the limitations of the current Internet Protocol – IPv4.
2. Discover key features of IPv6, including larger addresses, security and support for real-time applications.
3. Understand the objectives behind the IPv6 transition plans: IPv4 compatibility, incremental upgrades for multivendor networks, and investment protection of the installed base.
4. Gain detailed insights into how the IPv6 transition will affect other supporting protocols, such as Ethernet, token ring, ICMP, RIP and OSPF.
5. Learn how leading vendors such as Bay Networks, Cisco Systems, Digital, FTP Software, IBM, Novell, Process Software, Sun, Wandel & Goltermann, and others are implementing IPv6.
6. Analyze the formats of the IPv6 packet header, Extension headers, ICMPv6 messages, Neighbor Discovery messages and others.
7. Define the principal motivation driving your IPv6 upgrade strategy: host-based features or router-based features.
8. Learn how to strategically plan your transition from IPv4 to IPv6, and steps that should be taken at critical points along the way.
9. Learn about the 6Bone — a worldwide IPv6 network operating in over two dozen countries and how to connect your network and gain personal experience with IPv6.
10. See live illustrations of key IPv6 features, including address autoconfiguration, router solicitations/advertisements and tunneling.

REGISTER AND YOU WILL RECEIVE . . .

- *Comprehensive Seminar Workbook*
- *Copy of Troubleshooting TCP/IP, 2nd Edition, by Mark A. Miller, P.E.*
- *Exclusive Protocol Reference Guides: IPv6, TCP/IP and OSP*
- *CD containing over 1,000 Internet RFC, FYI and STD reference documents*
- *Luncheon and break refreshments*
- *All of the above included in your $450 registration fee (Save with our new team discounts for two or more attendees!)*

Note: If you can't attend, call us and order this informative and useful attendee materials kit for just $129.00!



www.nwfusion.com/seminars

NetworkWorld Fusion

Visit us on-line . . .
- Complete seminar outline
- Comprehensive presenter bio
- Past attendee comments
- Register for the seminar nearest you

Automated fax-back information available by calling (800)756-9430.

Register today!

(800)643-4668 • www.nwfusion.com/seminars

SPONSORED BY:

Bay Networks

IBM eNetwork Software

Novell

Wandel & Goltermann
Communications Test Solutions

If you are interested in sponsorship opportunities, please call 508/820-7520.

Assured

Continued from page 1

to develop software or work with third-party developers to deliver software that will let customers monitor Internet service levels, said Marilyn Suey, Assured's vice president of marketing.

The company, backed by $19 million in venture funding, sees Ascend Communications, Inc. as its key competitor. Assured will try to differentiate itself by enabling ISPs to offer customers different qualities of Internet or intranet access. For instance, customers can sign up for services that give them Internet access regardless of how crowded the network access lines are, even if it means bumping off an end user with a lower quality of access.

"The only other place I've seen that is in the military, where they call it precedence preemption," said Bob Bellman, president of consultancy Brook Trail Research.

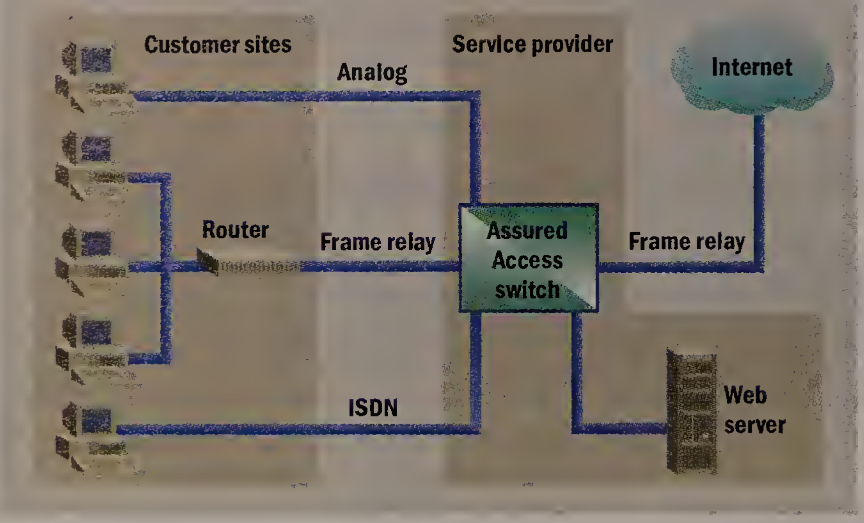
For users willing to pay for it, quality of access would let them avoid getting a busy signal when they try to connect with the network.

Once users get on the network, the switches will support four service quality levels that prioritize traffic within the switch to determine which packets are processed first.

The switches — now in alpha testing — also will support a feature called private router, which dedicates packet processing power to a given VPN as defined by the service provider.

Quality of service, quality of access

Assured Access Technology switches support a variety of access options, as well as routing. With the switches, service providers can support four qualities of service and guarantee access to designated users.



Inside the switches

When the company officially launches itself next month, it will wheel out the six-slot X600 and 10-slot X1000, which it plans to deliver by year-end.

The slots can be populated with a variety of WAN and LAN cards, and traffic from them is switched across redundant 1G bit/sec cell buses.

Each card has its own processing component, called a forwarding module, that performs routing. That is supplemented by different interfaces called personality modules.

Initially, the personality modules will include interfaces for 56K bit/sec modems, ISDN and frame relay as well as a 52M bit/sec high-speed serial interface and 10M/100M bit/sec Ethernet interface. Later releases will support ATM and flavors of digital subscriber line.

With those interfaces, the boxes can take in customer traffic and direct it to a Web server or VPN via an Ethernet port or to the Internet at large over a frame relay link.

The boxes are designed to reduce the kludge of gear inside service providers' points of presence (POP) by eliminating the need for some routers and Ethernet switches. With gear from fewer vendors inside the POPs, the sites will be easier to manage, Suey said.

To speed development of the switches and ensure quality, Assured has assembled the gear using proven technology from vendors including Rockwell International Corp. and Siemens AG, Klein said.

Klein regards Ascend as Assured's main rival, with its MAX family of remote access switches. One reason Assured decided to go after the access market is that Klein did not see any other company giving Ascend much competition in the ISP market. Cisco Systems, Inc., Bay Networks, Inc. and others were basically retrofitting enterprise network switches to work at ISP POPs.

Assured is rushing to get its products in the hands of ISPs before similar devices surface. "We can't assume Ascend is sleeping at the wheel," Klein said.

© Assured: (408) 941-1800

Bugs

Continued from page 1

decline to accelerated release schedules. Moreover, critics contend, Lotus has yet to rectify the support problems — slow responses and unsatisfactory answers — it acknowledged at its January user conference.

Lotus officials insisted their quality controls are stringent and superior to those of their competitors. Bugs are inevitable, they said, but Lotus catches the important ones before shipping finished products and handles those discovered later with immediate patches and scheduled quarterly maintenance releases. A major new support initiative is already bearing fruit, they added, having reduced waiting time on support calls to 3 minutes or less.

"We're not looking at any kind of a critical problem," said Sean Loiselle, a senior Lotus Notes product manager. "We won't ship a product until it's ready. Date is not the first priority for us, quality is."

Discernible downturn

However, a discernable quality downturn began last year, according to an executive at one Lotus Business Partner, who requested anonymity.

"There hasn't been a release in the [Notes] 4.0 series that hasn't required a quick patch release: 4.0 went to 4.0A, 4.0B, 4.0C; 4.1 went to 4.1A immediately; 4.11 went to 4.11A immediately; 4.5 went to 4.5A," said the executive.

Another customer said he "absolutely agrees" that Lotus quality has slipped.

"The [Notes] companion products are the ones I have found have given us a lot of problems; the Message Transfer Agents [MTA], in particular," said Robert Wunder, task manager of messaging and groupware at Sherikon, Inc., in Orlando. "Also, the tools that they had put out for migration between cc:Mail and Notes Mail, those things were just absolutely buggy." The impact of the cc:Mail MTA bug — which Lotus issued a patch for earlier this summer — was serious, Wunder said. "We had 300 users who were offline from their e-mail for almost a week and a half."

Merely reporting a bug can be frustrating, according to a third Lotus customer.

"Lotus support reps must get their pay docked when they report a bug to the development team," said Joe McGinn, author of a soon-to-be-released book entitled *Inside LotusScript*. "It seems like these people will do almost anything to talk a customer *out* of reporting buggy behavior as a bug."

Lotus officials insist they have no desire to dissuade bug reports.

"[Support personnel] are not trying to push back and say what [customers] are experiencing is not a bug," said Bob McDonald, director of Notes support services. "What they're trying to do is make sure that we do have all the information to state that this in fact is a problem that is known, and here's the workaround."

According to Tom Sullivan, a quality engineer at Eastman Kodak Co., in Rochester, N.Y., Lotus telephone support response is still slow, and the company has been tardy fixing bugs they do acknowledge. He said, "a bug of major proportion" in Notes 4.1 was still a problem in Notes 4.5.

Sullivan said he recently encountered "a new bug whereby a Notes database that has been accessed via a browser now has a 'logical scar,' and the database's server constantly thinks 'the database is in use by you or another user' when it is not." The scar prevents a systems administrator from deleting the file at the operating system level, he added. "Now that Lotus is part of IBM, I see two companies whose pasts are littered with such abuses, and I expect things to get worse before they get better," Sullivan said. "If there were an alternative to Notes, I'd switch right now."

Quality is fine

A number of those interviewed disagreed with the negative characterizations of Lotus' recent releases.

"The quality of the Notes products I have worked with has been very, very high," said Carla Prather, leader of the Alamo [Texas] Area Lotus Notes User Group. "I worked with 4.5 beta before it was released, and I was really surprised with how clean that was, being a beta product."

Eric Sachs, chief technology officer at Houston-based Interliant, a networked applications service provider, believes the recent Lotus releases have been rock solid. Customer grumbling, he said, may be attributable to the unavoidable complexities inherent in transforming Lotus from a proprietary to a standards-based software vendor.

"Lotus has spent a lot of time these days concentrating not on extending the functionality of the product but exposing their current functionality via Web standards," Sachs said. "In that case, they are sort of stuck with the limitations of those Web standards; they are not quite as powerful as Notes. So a lot of the bugs that I find are more related to the Internet standards."

Phil Gibson, director of InterActive Marketing at National Semiconductor Corp. in Santa Clara, Calif., believes Lotus' bug rate to be "no more than any other Web software I work with."

As for what causes these types of problems for any vendor these days, Gibson's theory would appear to be the prevailing one.

"It's just the panic of the market," he said. ■

Get more information online at www.nwfusion.com
DocFinder: 3418

NetworkWorld 161 Worcester Road, Framingham, Mass. 01701-9172. (508) 875-6400

Periodicals postage paid at Framingham, Mass., and additional mailing offices. Posted under Canadian International Publication agreement #0385662. *Network World* (ISSN 0887-7661) is published weekly, except for a single combined issue for the last week in December and the first week in January by *Network World*, Inc., 161 Worcester Road, Framingham, Mass. 01701-9172.

To apply for a free subscription, complete and sign the qualification card in this issue or write *Network World* at the address below. No subscriptions accepted without complete identification of subscriber's name, job function, company or organization. Based on information supplied, the publisher reserves the right to reject non-qualified requests. Subscriptions: 1-508-820-7444.

Nonqualified subscribers: $5.00 a copy; U.S. - $129 a year (except Washington, DC, Utah and Florida $136.74); Canada - $160.50 (including 7% GST, GST #126659952); Central & South America - $150 a year (surface mail); Europe - $205 a year (surface mail), all other countries - $300 a year (airmail service). Four weeks notice is required for change of address. Allow six weeks for new subscription service to begin. Please include mailing label from front cover of the publication.

Network World can be purchased on 35mm microfilm through University Microfilm Int., Periodical Entry Dept., 300 Zebb Road, Ann Arbor Mich. 48106.

Network World is distributed free of charge in the U.S. to qualified management or professionals who meet ALL of the following criteria:

1) Have site purchasing influence.
2) Are involved in the purchase of network products and services.
3) Have multi-platform networks installed or planned (including network architectures, LAN operating systems and LAN environments).

PHOTOCOPY RIGHTS: Permission to photocopy for internal or personal use or the internal or personal use of specific clients is granted by Network World, Inc. for libraries and other users registered with the Copyright Clearance Center (CCC), provided that the base fee of $3.00 per copy of the article, plus 50 cents per page is paid to Copyright Clearance Center, 27 Congress Street, Salem, Mass. 01970.

POSTMASTER: Send Change of Address to *Network World*, P.O. Box 3090, Northbrook, IL 60065.

Copyright 1997 by *Network World*, Inc. All rights reserved. Reproduction of material appearing in *Network World* is forbidden without written permission.

BPA INTERNATIONAL
RED TAG

Reprints (minimum 500 copies) and permission to reprint may be purchased from Reprint Services, 315 5th Ave. N.W., St. Paul, MN 55112 (612) 582-3800.

USPS 735-730

1.8 million feet of cable, 12,000 nodes, five days.

Exhibition • October 8-10, 1997 • Atlanta, Georgia

script language cgi, HTML, VRML, binary<language=Java Script
VLAN, Gigabit Ethernet, ATM, IPv6, SONET, IP Switching, Rem

The InteropNet:

Networking's Ultimate Interactive Learning Tool.

NetWorld®+Interop® is the launching pad for cutting-edge, enterprise-class network solutions. Integral to its success is the InteropNet®—the largest short-term, real-time network in the world. October 6–10, networking's top vendors will set their competitive differences aside and collaborate to create a multilayered blueprint of networking's future, in full operation.

The InteropNet is built on three dynamic layers: cutting-edge technologies available today, beta technologies to be deployed in 18 to 24 months, and outside-the-envelope solutions you haven't even heard of yet. Combined with the InteropNet Applications Forum—live vendor demonstrations of exciting new enterprise applications like Internet databases, Push technologies, Multicast, Security and more—the InteropNet is solving the critical problems every CIO and MIS faces today.

Get a close-up look at the tools, technologies and network applications you'll deploy across your enterprise now and into the 21st century.

Register Today for NetWorld+Interop 97 Atlanta.

Atlanta, Georgia
Georgia World Congress Center
October 6–10, 1997

For Registration/Information:
1-800-962-6513
Int'l 415-372-7079
www.interop.com

SOFTBANKforums
NETWORLD
+INTEROP

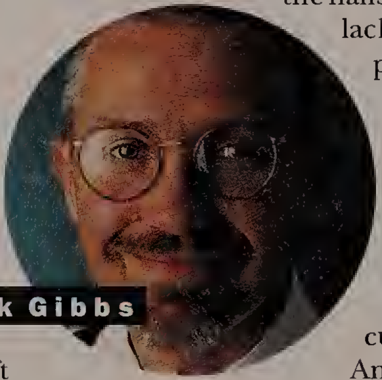
CWI7ESPC

©1997 SOFTBANK Forums. Interop is a registered trademark and InteropNet is a trademark of SOFTBANK Forums. NetWorld is a service mark of Novell, Inc. All other names are the property of their respective holders.

Backspin

An Apple for Bill means you will be assimilated

Meteors, money and a deal with the devil.



Mark Gibbs

Well, it's half past one in the morning on Aug. 11, and I'm going to light up a cigar and go sit out on the back patio and see if I can spot meteors. Tonight being the first night of the Perseid meteor shower, it should be good viewing.

Traditionally, meteors and comets were considered to be omens, portents of great and usually bad events. So if you're a Macintosh user, you may think the Perseid shower comes just in time. Unless you've been hiding away on your private Pacific island again, you know that Microsoft recently handed Apple $150 million.

<digression>How did it start? Bill is watching television. On a whim, he slips his hand down the back of the sofa. "Look at this, honey," he says to his wife. "What should I do with all this loose change?" The rest is history...<digression>

Well, I think Mr. Gates and company made a masterly move. With one wave of the checkbook, they have defused the antitrust issue (but don't kid yourself; like the Terminator, Ms. Reno will be back), taken some of the glister and attention away from the Java booster, gotten rid of that dusty, old "look and feel" lawsuit that Apple and Microsoft have been jousting over for years and — last but not least — stuffed Internet Explorer firmly into the market's maw.

> *I don't think Microsoft is offering respect. I think it is buying Apple's soul. Apple is selling out — they have signed a deal with the devil.*

I'd say that was a lot of bang for the buck. All 150 million of them.

A faithful reader, Perrine Crampton, wrote to me saying, "As a Macintosh fanatic, I have mixed feelings. On the one hand, I think it's great that Microsoft is finally offering Apple some long overdue respect... On the other hand, I feel that Apple is selling out by agreeing to drop the 'look and feel' lawsuit and by including the [Microsoft Internet Explorer] browser instead of their own."

Perrine, I don't think Microsoft is offering respect. I think it is buying Apple's soul. You're right, Apple is selling out — they have signed a deal with the devil. And worse than that, Apple had little choice.

Just think about it. Stock plummeting, the halls of Apple HQ echoing from lack of warm bodies, scores of projects on hold or abandoned and still cash is hemorrhaging from every pore. One hundred and fifty million is a pretty tempting offer ("Just sign here, here, here and here ... Oops, out of ink, can I just make a little cut on your thumb?").

And will that be the end of the handouts? Nope. I bet the Redmond mafia will throw more money at Apple if needed, and because it will be needed, Apple will take it, attached strings and all.

And those attached strings will change the underpinnings of the market. I expect that the inclusion of Internet Explorer with the Mac operating system is the thin edge of the wedge. Next there'll be VBScript on the Mac, then Visual Basic for applications and ... well, you name it, if it can be migrated, it will.

But the result may not be so bad. Microsoft just might wind up giving us what we've always claimed we wanted: really solid cross-platform support. Applications that can be easily ported from one platform to another. Supporting technologies that are platform-independent. The only price to pay is that Microsoft will own it all.

I believe we're seeing the first steps toward the total assimilation of Apple. The MacOS won't vanish overnight; it will be absorbed. Windows will become more Mac-like and the MacOS will just fade way. Microsoft makes *Star Trek's* Borg look like complete wusses.

But the bottom line here is that all you Mac fanatics out there, watch out. Forget your cries of "We've had that for years" and "Who needs that?" at every Windows announcement. The Windows world is rushing at you. Resistance is futile. You will be assimilated.

Let me know if you're being assimilated or if you saw any meteors at nwcolumn@gibbs.com or at (800) 622-1108, Ext. 504.

'NET BUZZ

The latest on the Internet/intranet industry

By Chris Nerney

MONEY, MONEY EVERYWHERE The early word on the latest **Price Waterhouse National Venture Capital Survey** is that 1997's second quarter will set a new investment record. And according to **Kirk Walden,** director of the quarterly Price Waterhouse survey of venture capitalists, "there's no evidence that Internet investments are slowing down."

Walden tells *'Net Buzz* that "there's a chance the second quarter could surpass the $2.8 billion in [Internet and non-Internet] venture deals in the second quarter of '96, the largest quarter we've ever recorded."

Further, Walden says, 1997 is on track to top the record $9.5 billion invested in 1996. Venture capital investments in the first quarter of this year were $2.34 billion, 5% ahead of investments during the first quarter '96.

The Price Waterhouse second-quarter survey will be released this Wednesday or Thursday.

SHAMELESS PLUG FOR ONE OF OUR FAVORITE WEB SITES Internet music retailer **CDnow, Inc.** has received $10 million in venture funding from an investment team led by **Grotech Capital Group** and **Keystone Venture Capital.**

CDnow offers more than 250,000 music-related products, including CDs, cassettes, movies, videos and laser discs. The company's Web site (www.cdnow.com) allows users to search for their favorite recordings and artists and also offers 30-second audio samples of thousands of songs.

Based in Jenkintown, Pa., CDnow was founded in 1994 by twin brothers **Jason** and **Matthew Olim,** who plan to use the venture funds for marketing and advertising.

WWW.LOCATION.LOCATION.LOCATION They say no one can really own cyberspace, but that doesn't mean real estate agents can't try to make some money from it.

Coldwell Banker Real Estate Corp., of Parsippany, N.J., for instance, says its Web listing site (www.coldwellbanker.com) has resulted in 1,700 transactions in the past four months. Not bad, considering the overhead for a real estate Web site is less than what a typical agent spends each year on a three-pack-a-day smoking habit.

Another online real estate Web site company, **ListingLink LLC,** of Santa Monica, Calif., is using virtual reality to snag potential buyers.

Of course, real estate agents have been employing virtual reality for years — they call it "closing costs." ListingLink's version, however, is based on technology developed by start-up **Be Here Corp.,** of San Jose, Calif.

Be Here has created a panoramic camera system that processes a 360-degree image of the area surrounding the camera to form a virtual reality image that can be explored on any browser.

By using the mouse, viewers can see everything in a house, including the rug stain they're trying to hide with that magazine rack in the middle of the living room.

Be Here's URL is www.behere.com. ListingLink can be found at www.listinglink.com.

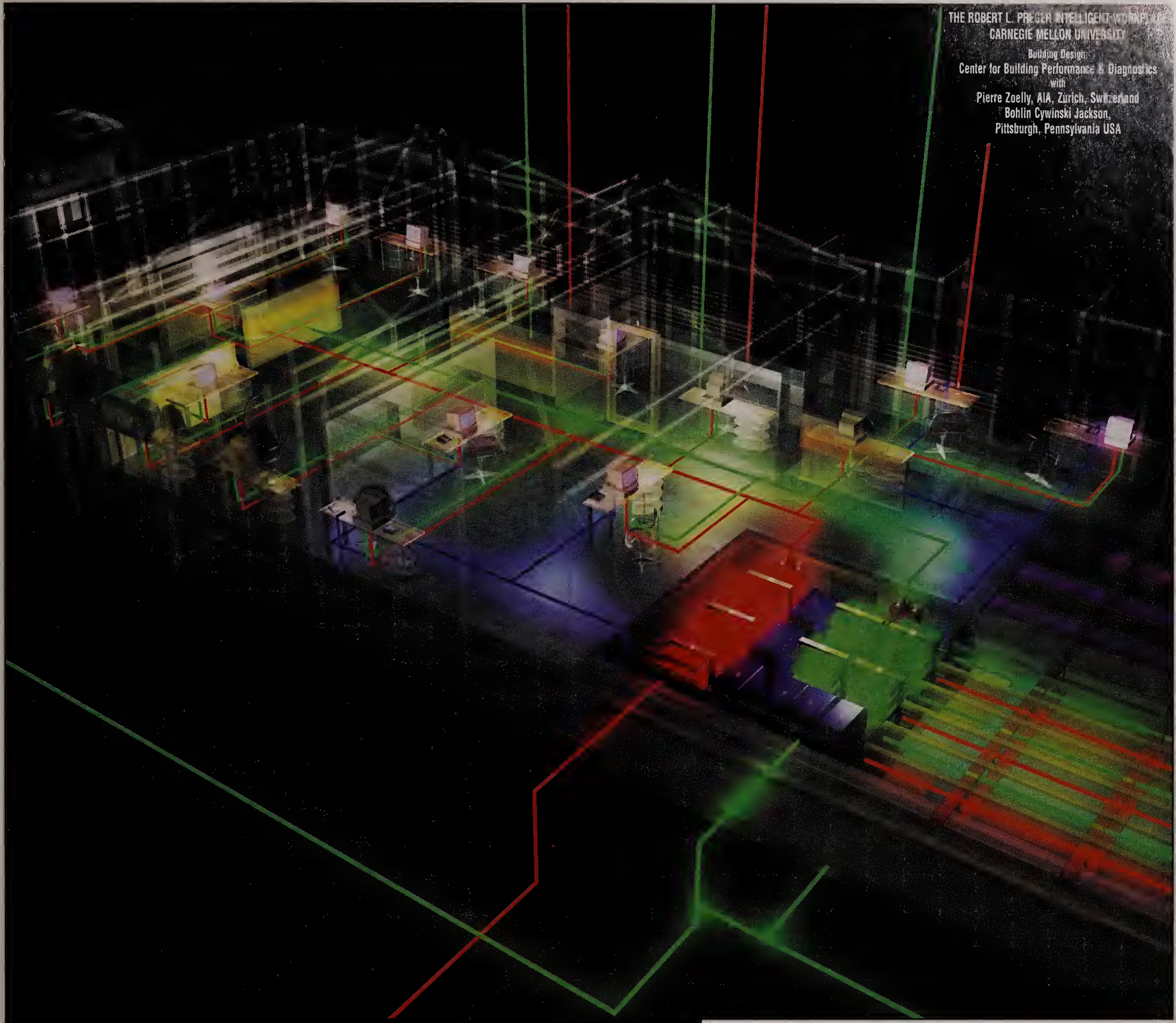
GET YOUR PIECE OF THE ACTION Tired of watching the venture capitalists and self-proclaimed visionaries make a fortune on the Internet while you sit in some dank programming room, churning out code and chugging down Cokes?

A book due out next month promises to help you cash in on the vast money-making opportunity that is cyberspace.

The Geek's Guide to Internet Business Success walks you through finding a market niche, developing a strategy and managing a company.

Written by **Bob Schmidt,** founder of **Provider Marketing Group, Inc.,** the book is geared toward content developers, programmers, consultants and service providers. The publisher is Van Nostrand Reinhold, and the price is $22.95.

We're working on our own book, but are still looking for the ideal protagonist. If you send us your very best Internet- or intranet-based news, rumor or plot line . . . well, let's just say you'll be on the "short list." Contact Chris Nerney at (508) 820-7451 or cnerney@nww.com.


THE ROBERT L. PREGER INTELLIGENT WORKPLACE
CARNEGIE MELLON UNIVERSITY
Building Design:
Center for Building Performance & Diagnostics
with
Pierre Zoelly, AIA, Zurich, Switzerland
Bohlin Cywinski Jackson,
Pittsburgh, Pennsylvania USA

Only one company
makes great cable the way AMP
makes great connectors.

AMP is in the total solution cabling business in a big way, producing nearly 65 million feet per month of Category 5, FUTURELAN 350, multimode and singlemode fiber optic cable and a variety of specialty cables in one vertically-integrated, process-controlled, state-of-the-art plant. If you made connectors as good as ours, would you want just any old cable running between them? Find out more about AMP cable. Call AMP at 1-800-835-7240.

AMP Incorporated, Harrisburg, PA 17105-3608. Call **1-800-835-7240.**
Outside the U.S., please contact your local AMP sales office.

Connecting at a HIGHER level™

www.amp.com/networking AMP, Connecting at a Higher Level and FUTURELAN 350 are trademarks.

AMP

*Circle Reader Service #***9**

ADVANCED DATA SOLUTIONS FOR CORPORATE CHALLENGES

Has your present technology left gaps in your communications network?

Consult with Sprint's data experts for a comprehensive solution to link your disparate communications networks. Sprint's Frame Relay Service can connect your e-mail, private line, and SNA networks, plus give you Internet access over the same seamless network. This commitment to meeting your needs is why we operate the world's largest public data network and were the first to announce public frame relay service nationwide. Because we believe you should expect nothing less from a worldwide leader in data communications. **www.sprint.com/sprintbiz 1•800•588•DATA**

Sprint®

We help your business do more business℠

©1997 Sprint Communications Company L.P.